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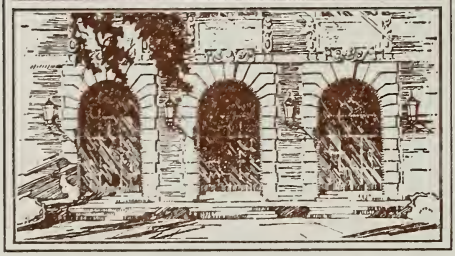

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1972/1974

Graduate Programs

University
of Illinois
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UNIVERSITY OF ILLINOIS BULLETIN

UNIVERSITY OF ILLINOIS BULLETIN
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It is the policy of the University of Illinois to afford equal educational opportunities to qualified persons regardless of race, religion, sex, or ethnic background.

1972/1974
Graduate Programs

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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UNIVERSITY CALENDAR

A Graduate College Calendar giving important dates and deadlines for graduate students enrolled on campus may be obtained in 330 Administration Building.

Eight-Week Summer Session, 1972

June 16, Fri.–June 17, Sat., 2:00 p.m.	Registration of graduate students
June 19, Mon., 7:00 a.m.	Instruction begins
July 4, Tues.	Independence Day all-campus holiday (no classes)
July 17, Mon.	Beginning of second four-week courses
Aug. 10, Thurs.	Last day of instruction
Aug. 11, Fri.–Aug. 12, Sat.	Summer session examinations

First Semester, 1972-1973

Sept. 14, Thurs., 8:00 a.m.–Sept. 16, Sat. (noon)	Registration
Sept. 18, Mon., 7:00 a.m.	Instruction begins
Oct. 23, Mon.	Veterans Day observance (classes dismissed 10:45 to 11:15 a.m.) (nonacademic holiday)
Nov. 22, Wed., 1:00 p.m.	Thanksgiving vacation begins
Nov. 23, Thurs.,–Nov. 24, Fri.	Thanksgiving all-campus holidays
Nov. 28, Tues., 1:00 p.m.	Thanksgiving vacation ends
Dec. 22, Fri., 1:00 p.m.	Christmas vacation begins
Dec. 25, Mon.	Christmas Day all-campus holiday
Jan. 1, Mon.	New Year's Day all-campus holiday
Jan. 3, Wed., 1:00 p.m.	Christmas vacation ends
Jan. 13, Sat.	Last day of instruction
Jan. 15, Mon.–Jan. 23, Tues.	Semester examinations

Second Semester, 1972-1973

Feb. 1, Thurs., 8:00 a.m.–Feb. 2, Fri.	Registration
Feb. 5, Mon., 7:00 a.m.	Instruction begins
April 14, Sat., 1:00 p.m.	Spring vacation begins
April 20, Fri.	Good Friday all-campus holiday
April 23, Mon., 1:00 p.m.	Spring vacation ends
May 4, Fri.	Honors Day (classes dismissed at noon)
May 26, Sat.	Last day of instruction
May 28, Mon.	Memorial Day all-campus holiday (no classes)
May 29, Tues.–June 6, Wed.	Semester examinations
June 9, Sat.	Commencement exercises

Eight-Week Summer Session, 1973

June 15, Fri.—June 16, Sat., 2:00 p.m.	Registration of graduate students
June 18, Mon., 7:00 a.m.	Instruction begins
July 4, Wed.	Independence Day all-campus holiday (no classes)
July 16, Mon.	Beginning of second four-week courses
Aug. 8, Wed.	Last day of instruction
Aug. 9, Thurs.—Aug. 11, Sat.	Summer session examinations

First Semester, 1973-1974

Aug. 23, Thurs.—Aug. 25, Sat. (noon)	Registration
Aug. 27, Mon.	Instruction begins
Sept. 3, Mon.	Labor Day all-campus holiday
Oct. 22, Mon.	Veterans Day all-campus holiday
Nov. 20, Tues., 5:00 p.m.	Thanksgiving vacation begins
Nov. 22 and 23	Thanksgiving all-campus holidays
Nov. 26, Mon., 7:00 a.m.	Thanksgiving vacation ends
Dec. 14, Fri.	Last day of instruction
Dec. 15, Sat.—Dec. 22, Sat.	Semester examinations

Second Semester, 1973-1974

Jan. 17, Thurs.—Jan. 19, Sat. (noon)	Registration
Jan. 21, Mon.	Instruction begins
Mar. 16, Sat., 1:00 p.m.	Spring vacation begins
Mar. 25, Mon., 7:00 a.m.	Spring vacation ends
Apr. 19, Fri.	Honors Day (classes dismissed at noon)
May 10, Fri.	Last day of instruction
May 11, Sat.—May 18, Sat.	Semester examinations
May 25, Sat.	Commencement exercises

The Graduate College

The University of Illinois offers programs leading to advanced degrees at the Urbana-Champaign campus, at the Medical Center campus (medical and dental sciences, pharmacy, and nursing), and at the Chicago Circle campus. The information contained in these pages applies to the Urbana-Champaign campus, located 130 miles south of Chicago in a community of about 97,000.

The Graduate College enrollment at Urbana-Champaign includes students from every state plus eighty-eight foreign countries and exceeds 8,000 out of a total campus enrollment of over 32,000. A graduate faculty of nearly 1,800 offers instruction leading to advanced degrees in over one hundred fields of study. This large faculty and diverse student population, together with comprehensive library resources, numerous special laboratories and facilities, and a wide selection of social and cultural activities, make the University of Illinois at Urbana-Champaign an especially attractive environment for graduate study.

UNIVERSITY RESOURCES

Libraries

The University Library's resources for advanced study and research are outstanding. Its present collections now exceed 5,000,000 volumes, all but about 600,000 of them located in Urbana-Champaign. The remainder are held by the Library of Medical Sciences in Chicago and the Library at Chicago Circle. In addition to these cataloged volumes, the University Library at Urbana-Champaign contains approximately 557,000 pamphlets, 400,000 maps and aerial photographs, 345,000 music scores and parts, and 428,000 microtexts. The library receives more than 27,000 periodicals and newspapers.

Outstanding collections have been developed for a variety of fields. In the humanities, strong areas include classical literature, history, and archaeology; English literature of the sixteenth through the twentieth centuries; Romance and Slavic literature; German literature of the sixteenth and seventeenth centuries; American humor and folklore; and comparative philology. In the fine arts, collections in architecture, landscape architecture, and music are noteworthy.

Holdings in the social sciences include significant collections in history of the western United States, Abraham Lincoln and the Civil War, Latin America of the revolutionary period, medieval and modern Europe, Ireland, and the Slavic countries. Also noteworthy are collections in international law and relations, political science, law, economics, labor and industrial relations, and education.

Strong areas in science and technology include mathematics, chemistry, biological sciences (espescially parasitology, entomology, and ornithology), physics, geology, engineering, and agriculture.

Many of these collections are housed in the Rare Book Room. Notable strengths in that room lie in Milton's works and Miltoniana (including the best collection extant of seventeenth-century editions); religious and educational texts influencing Milton, Shakespeare, and their contemporaries; emblem books of Germany and the low countries; British historical, economic, and literary works of the eighteenth century; H. G. Wells's correspondence and works; and original and early editions of sources in the history of geology.

The Library's bibliographical facilities comprise a general catalog of more than 7,000,000 cards, printed catalogs of libraries, e.g., the Bibliothèque Nationale, British Museum, and Library of Congress; national and trade bibliographies of all countries for which such works have been issued; bibliographies of special subjects; and similar aids.

A number of departmental and divisional libraries are maintained. The main library houses the following principal collections: Classics, Commerce, Education and Social Science, English, History and Philosophy, Human Relations Area Files, Library Science, Map and Geography, Modern Language, Newspaper, Physical Education, and Rare Book Room.

Elsewhere on the campus are the following departmental libraries: Agriculture, Architecture and Fine Arts, Biology, Ceramics, Chemistry, City Planning and Landscape Architecture, Communications, Engineering, Geology, Home Economics, Labor and Industrial Relations, Law, Mathematics, Music, Natural History Survey (entomology and other biological sciences), Physics, Veterinary Medicine, and the Undergraduate Library.

Further facilities available for graduate students are the general bookstacks, housing about 3,500,000 volumes, and over 400 carrels in the bookstacks, assigned to individuals engaged in extended study and research. Interlibrary loan service is provided for those engaged in research for dissertations.

Interdisciplinary and Multidisciplinary Academic Units

Children's Research Center. The Children's Research Center contains laboratories specializing in research on children in such areas as psychophysiology, motor performance and play research, attention and memory, speech development, day care, infant attention and learning, psychopharmacology, and learning disabilities. In addition, four normal nursery school classes of children are conducted in the building, and the children are available for participation in research. Satellite facilities for research with children, operated by the center, are located in neighboring public schools and state institutions. Several trailer laboratories are used by the staff in conducting research on the site at public schools.

Situated on the south edge of the campus, the Children's Research Center shares a site with the Adler Zone Center operated by the State of Illinois Department of Mental Health. Patients from the Adler Center, which serves an eighteen-county area in east central Illinois, often participate in research projects conducted at the Children's Research Center.

Computer-based Education Research Laboratory (CERL). CERL has designed and is operating PLATO III, a flexible and sophisticated computer-based education (CBE) system. The system uses a Control Data Corporation 1604 computer as the central control unit for up to twenty student terminals; all student terminals can be used independently and simultaneously. In addition to a twenty-terminal CBE classroom at CERL, two other classrooms are located at educational institutions in the Urbana-Champaign community and one in another part of the campus. The system has been used for more than 150,000 student-contact hours of credit teaching. Some of the areas in which studies have been conducted are electrical engineering, geometry, biology, nursing, political science, chemistry, algebra, mathematics, economics, and French, Latin, and Russian. The PLATO III system is the predecessor of a PLATO IV system of 4,000 student terminals under the control of a central computer which is to be in operation by 1975. It is anticipated that approximately 200 of the PLATO IV terminals will be installed during the fall semester of 1972-1973.

Center for Advanced Computation. The Center for Advanced Computation conducts applied research and provides services to the academic community and state and federal governments. The center promotes interdisciplinary and applied research, and supports the development of computer technology which will contribute to the solution of problems of importance to society. A principal activity of the center is the development of numerical techniques and software systems for calculations in the social, life, and physical sciences.

The staff of the center consists of professionals, graduate research assistants, and academic personnel having joint appointments with academic departments including Computer Science, Engineering, Psychology, Landscape Architecture, Political Science, Labor and Industrial Relations, Economics, Agricultural Economics, Business Administration, and Life Sciences. Center staff with joint appointments may teach courses in their academic departments and supervise graduate theses supported by center contract funds. There are research activities in numerical analysis, mathematical programming, information systems, economic modeling, land use/transportation planning, computer languages and operating systems, and graphics systems. Interdepartmental graduate research and educational activities are being developed around the research efforts, methodologies, and systems developed at the center.

The center has local access to a Burroughs B6500 computer system and to a large variety of computational resources, including the ILLIAC IV system, via the Advanced Research Projects Agency (ARPA) Network. This highly reliable network links many of this country's major computer research laboratories and facilities through high-speed telephone lines. The center provides the education, documentation, consultation, and hardware and software development necessary for University of Illinois research faculty to effectively use the center and ARPA Network facilities in collaboration with center staff.

Coordinated Science Laboratory. The Coordinated Science Laboratory is organized to provide an interdisciplinary research environment to stimulate interaction among faculty and students from engineering sciences as well as other areas. The laboratory contributes to the graduate instructional program of the University by providing research facilities for graduate students in all of its programs.

Faculty members typically hold joint appointments in the Coordinated Science Laboratory, where they conduct their research and supervise the research of graduate students, and in an academic department, where they teach. Graduate students conducting thesis research in the laboratory earn their advanced degrees in the departments in which they are enrolled. There are research activities in plasma physics, surface

science, semiconductor devices, thin film devices, information theory and coding, systems theory, communication systems, switching theory and automatic fault diagnosis, artificial intelligence, high-density memories, plasma displays, man-machine interaction and retrieval, urban modeling development, optical information processing, and computational gas and fluid dynamics.

In addition to the usual supporting services, the laboratory maintains unique facilities in materials processing, including photo-chemical etching, electron beam welding, inert gas brazing, chemical plating, and glass-blowing. Present computational facilities available to the laboratory include a Control Data Corporation 1604 digital computer with a graphic display, a hybrid system consisting of a Control Data Corporation 1700 digital computer and an EAI-680 analog computer, a Burroughs 6500 computer system, and a Sigma 5 computer system.

Laboratory for Atmospheric Research. The Laboratory for Atmospheric Research provides an opportunity for students majoring in engineering and the physical sciences to specialize in atmospheric science and to undertake thesis research in any of the following subjects: numerical weather prediction; numerical model of atmospheric systems; dynamics of tropical circulation; atmospheric turbulence; planetary boundary layers; atmospheric wave dynamics, upper atmospheric dynamics; planetary atmosphere; micro-physical processes in clouds; and hydro-meteorology. The instructional activities and the facilities of this laboratory also are of interest to students specializing in ecology, bio-climatology, geography, environmental health, and related fields.

Research facilities available in the laboratory include access to the unique computing facilities of the National Center for Atmospheric Research located in Boulder, Colorado.

Materials Research Laboratory. The Materials Research Laboratory supports the training of graduate students and research in the materials sciences in cooperation with the Departments of Ceramic Engineering, Chemistry, Chemical Engineering, Electrical Engineering, Geology, Metallurgy and Mining Engineering, and Physics. Emphasis is placed on interdisciplinary research which is basic to an understanding of the solid state of matter. The laboratory contains machine and glass shops, cryogenic facilities, high temperature, toxic materials, x-ray, electron microscope and electron microprobe laboratories, a chemical analysis laboratory with emission and mass spectrographic equipment, and a 3 MEV electron accelerator.

Special Laboratory or Research Facilities

Computing Services Office. Campus-wide computing facilities for stu-

dents and faculty engaged in research are provided by the Computing Services Office. This central facility, located in the Digital Computer Laboratory, houses an IBM System/360-75 with three million bytes of core storage which processes an average of 50,000 jobs per month. Eight terminals, scattered throughout the campus, provide convenient job entry stations. The main facility also provides documentation, consulting, programming, and keypunching services for computer center users. The computer facilities are available around the clock and are used by students and staff in such diverse fields as fine and applied arts, engineering, law, agriculture, journalism, and education.

Electron Microscope Facility. The Electron Microscope Laboratory, located in the basement of Bevier Hall, is a central facility for instruction and research in behalf of all University departments. It is equipped with a Siemens Elmiskop 1, a highly modified Hitachi HS-6, RCA models EMU-3H, EMU-3E, EMU-3D, EMU-3C, EMU-2C, and EMU-2E electron microscopes, and a Cambridge Stereoscan electron microscope. Ancillary equipment includes seven ultramicrotomes, four shadowcasters, an electron gun for vaporization of refractory materials, an RCA electron diffraction unit, a Steere unit for freeze-etching, a freeze-dry apparatus that operates at minus 100 $\pm$ 50°C, and four complete photographic darkrooms and general facilities. These facilities are available for research conducted by qualified members of the faculty and graduate students.

The instructional program consists of graduate courses, lectures, demonstrations, and laboratory work on the physical principles and electron optics of the transmission of electron microscopes and modern variants; the theory and design of electron microscopes; the operation of electron microscopes, with separate sections to meet special needs of biologists, geologists, and those interested in electron diffraction; and seminars and special workshops. The facilities are available for research conducted by qualified members of the faculty and graduate students.

Laboratory for Ergonomics Research. The facilities of the Laboratory for Ergonomics Research provide unique opportunities for pursuing interdisciplinary researches on the interaction of man, his work, and his working environment. All departments and divisions of the University needing closely controlled environmental conditions for research or instructional work may utilize the special skills and equipment available in the laboratory. These include an altitude chamber which accommodates six human beings, permitting simulation of altitudes to 45,000 feet. Air temperature and humidity may be controlled in this chamber to permit investigations of the combined stresses of low environmental

pressure and heat or cold. Additional controlled environmental rooms provide flexible areas where special test facilities may be installed. In addition the laboratory serves as the focus of teaching and research in the course sequence in ergonomics offered jointly by the Departments of Physiology and Biophysics, Mechanical and Industrial Engineering, and Physical Education.

Radioisotope Laboratory. The Radioisotope Laboratory is an all-University facility for graduate training and research involving the use of the tracer technique with carbon-14 or tritium or both. It is equipped with liquid scintillation spectrometers, vibrating reed electrometers, gas counters, radio-gas chromatography units, high vacuum systems, combustion set-ups, and auxiliary radiochemical equipment.

A prerequisite for research in the laboratory is the carbon-14 course, which emphasizes experimental techniques employed in the synthesis, degradation, isolation, establishment of purity, and assay of radioactive carbon compounds. Members of the staff present this course one semester each year.

Cultural Resources

Students at the University of Illinois have a wide choice of activities and facilities available to them. The *Daily Illini* regularly announces the selection, which ranges from folksinging to scholarly colloquia, and from experimental movies to major operatic productions. A dozen separate film series, their programs coordinated by the Film Center, provide a steady stream of cinematic diversions. Lecture series and symposia bring distinguished public figures to the campus for forums and public discussion sessions. The Illini Union, the campus social center, offers lounges, dining facilities, and recreational and meeting rooms to students and faculty.

The Krannert Art Museum, the largest of several museums on campus, provides galleries for displaying the University's permanent collection of art works and for presentation of other exhibitions. A University Festival of Contemporary Arts, held every two years, includes special events and exhibits in the areas of art, architecture, landscape architecture, urban planning, drama, motion picture, literature, printing, dance, and music.

The Krannert Center for the Performing Arts, with its four separate and specialized theatres, provides excellent facilities for orchestra, opera, choral organizations, theatre, and dance. The professional programs in these areas are housed in the center, which schedules performances by local groups and national and international touring companies.

ADMISSION

General Requirements

The Graduate College considers for admission only those applicants who hold or will be granted at the end of the current academic year a baccalaureate or an equivalent degree comparable to that granted by the University of Illinois, and whose admission average is at least 3.5 on a scale where A = 5.0. Admission averages are computed from the last sixty hours of undergraduate work and from any graduate work completed. The final decision on admission, however, rests with the applicant's proposed major department, which may set a minimum grade-point average significantly higher than that of the Graduate College and which may impose other special admission requirements and conditions.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses which have a bearing on the student's field of specialization should submit: (a) a written evaluation or letter grade by the instructor in each such course, and (b) scores on the Graduate Record Examination Aptitude Test. Applicants for graduate programs in accountancy, business, and business administration should use the Admission Test for Graduate Study in Business instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible. Applications for September admission are accepted up to September 1, but departmental enrollment quotas are usually filled by May 1 or earlier. Applications for admission in February and June are accepted until January 1 and May 15, respectively. Admission forms and complete information concerning admission may be obtained from the Graduate and Foreign Admissions Office, 312 Mining and Metallurgy Building, or from the Graduate College, 330 Administration Building. The student must submit a nonrefundable application fee of $15.00 through Semester I of 1972-1973. Beginning with applications submitted for admission in February 1973, this fee will be $20.00. The fee is waived for members of the academic and nonacademic staff of the University and allied agencies.

Foreign students must apply at least six weeks before the registration period. The applicant must submit official records of all his higher educational training, including certificates of degrees, with the dates the degrees were conferred. Eligible applicants whose native language is not English must also take the Test of English as a Foreign Language (TOEFL), given several times a year throughout the world. To make

arrangements to take this test, students should write directly to the Educational Testing Service, Box 592, Princeton, New Jersey 08540, U.S.A.

Summer Session

In addition to a two-semester academic year, the University conducts an eight-week summer session at Urbana-Champaign for both degree and non-degree students. Applications for admission to the Graduate College for the summer term should be submitted no later than May 15.

Applicants who seek a degree, but who do not expect to register on the campus during the academic year, should indicate on the application by an attached note that they expect to pursue campus course work only during summer sessions. If admitted, these students will maintain their matriculation and degree status from one summer to the next without having to apply for readmission. Matriculation will be discontinued for summer-only degree students who do not enroll on campus for a summer session, and these students will be required to apply for readmission. Summer-only degree students who wish to enroll for the fall or spring semesters may request this change through the Graduate and Foreign Admissions Office. Such changes must be approved by the major department.

Physical Examination

Each new student must present evidence of satisfactory physical and mental health to the Director of Health Services. Each eligible new student will receive a Student Health Report form that he should take immediately to his physician. The student is responsible for insuring that this report is completed and returned in advance of the registration period. Admission requirements are not satisfied until the report is received by the Office of Admissions and Records. Unless the student can present proof of freedom from tuberculosis as evidenced by the University of Illinois or a public health agency certificate (skin test or x-ray) dated within the last twelve months, he will be tested for tuberculosis during the registration period.

Residence Classification

The residence classification of an applicant is determined on the basis of information given on his application and other credentials. Tuition is assessed in accordance with this decision. Errors in residence classification or in assessments discovered following registration may result in adjustments of charges. A brochure, *Regulations Governing the Determination of Residency Status for Admission and Assessment of Student*

Tuition, is available at the Office of Admissions and Records, 177 Administration Building, Urbana, Illinois 61801.

FINANCIAL AID

Financial assistance is available to promising students in all fields of study. Fellowships and tuition and fee waivers, which require no service to the University, are awarded on the basis of academic achievement and potential. Teaching and research assistantships, which require service, are available in most departments.

Fellowships

University Fellowships. Students in all fields of graduate study are eligible for University fellowships, which are awarded in a campus-wide competition on the basis of academic and scholarly achievement. Applicants should be under age thirty-five at the time the award begins; they need not be citizens of the United States. University Fellowships provide a stipend of at least $2,000 for nine months or $2,500 for eleven months, and an exemption from tuition and fees. A Fellow must carry a full program of four units or the equivalent and may accept a teaching assistantship of no more than one-quarter time. A few University Dissertation Fellowships may be awarded to outstanding doctoral students in the humanities and social sciences.

Graduate College Fellowships are offered to students who show potential for success in graduate study, but who may have deficiencies in their undergraduate preparation. They are generally awarded to students beginning graduate work so that the Fellow can devote his first year entirely to study. Most of the Graduate College Fellows have been black Americans or members of other minority groups; the indication "Minority Applicant" on the application forms will help to insure consideration for a Graduate College Fellowship.

University Summer Fellowships for Teaching Assistants are restricted to graduate students who have held at least half-time teaching assistantships at the University of Illinois at Urbana-Champaign the preceding year, who have earned not less than two units of graduate credit during that year, and who have demonstrated superior scholarship. Fellows are selected in a campus-wide competition. The stipend is $500 for the eight-week summer session and an exemption from tuition and fees.

National Defense Graduate Fellowships. Under Title VI (Modern Foreign Languages) of the National Defense Education Act, the University of Illinois at Urbana-Champaign participates in programs in Asian, African, Latin American, and Russian and East European lan-

guage and area studies. NDFL Fellowships, restricted to citizens or permanent residents of the United States, are intended for students planning university teaching or other careers related to language and area studies.

Office of Education Fellowships. Fellowships are available in specialized areas of training of teachers and other school personnel from preschool through college levels. A student who expects to major in a department in the College of Education should direct inquiries to the Coordinator of Graduate Study, College of Education, 110 Education Building, Urbana, Illinois 61801, indicating his particular field of interest. Inquiries about teacher-training programs in academic fields should be directed to the student's major department.

Industrial, Endowed, and Special Fellowships and Traineeships. A number of awards are available in specific areas of study supported by grants from firms, foundations, and individuals. The stipends and supplemental allowances of these fellowships vary, and most of them are restricted to students in particular areas of study. Additional information may be obtained from the department in which the student expects to study.

Public Health Service Traineeships. USPHS Traineeeships, virtually equivalent to fellowships, support students enrolled for advanced training in health and health-related areas. Inquiries should be directed to the student's major department.

Assistantships

The various departments of the University appoint graduate students as teaching or research assistants, usually for half-time service. Applications should be made directly to the appropriate department. Assistants holding appointments ranging from 25 through 67 percent time are exempt from the tuition and service fee, but not from the hospital-medical-surgical fee.

A student may also apply for a part-time assistantship outside his major department in one of the nonteaching bureaus or agencies related to his work. For example, for further information and application materials, write directly to: Center for Instructional Research and Curriculum Evaluation, Institute of Government and Public Affairs, Institute for Research on Exceptional Children, or Small Homes Council–Building Research Council. All agencies may be addressed in care of the University of Illinois, Urbana 61801.

Part-time appointments as student residence hall counselors are also available. These provide cash stipends and room and board, as well as the same exemption from tuition and the service fee accorded other

staff members. Applications are available from the Associate Director of Housing for Student Affairs, Room 420, 610 East John Street, Champaign, Illinois 61820.

Tuition and Fee Waivers

These awards provide exemption from the tuition and service fee, but not from the hospital-medical-surgical fee, for the academic year and summer session immediately preceding or following. Students on waivers must be in residence and must register for at least three units each semester during the academic year; they may also accept part-time or incidental employment not to exceed twenty hours a week either with the University or with outside agencies.

Veterans who are admissible to a graduate program and who meet certain residence requirements may be eligible for exemption from tuition under the state statute concerning military scholarships. Further information may be obtained from the Director of Student Financial Aids, 707 South Sixth Street, Champaign, Illinois 61820.

How to Apply

Application materials with instructions may be obtained from the Graduate College or from any graduate department. To be considered for most fellowships beginning in June or September, the applicant must file with his major department no later than February 15, but preferably early in January. (The School of Music deadline is February 1, with the exception that applications in the area of voice are due January 15.) These deadlines do not apply to applications for assistantships, tuition and fee waivers, and certain industrial and special fellowships. However, applicants for such appointments are strongly urged to submit their applications as early as possible since many departments consider applications for assistantships and other awards at the same time they consider applications for fellowships. The first list of fellowship awards is announced after March 1.

Loan Funds

Information and application forms concerning major loans from the University, the National Defense Education Act, the Illinois Guaranteed Loan Program, the United Student Aid Fund, and other loan funds may be obtained from the Student Financial Aids Office, 707 South Sixth Street, Champaign, Illinois 61820. The amount of the loan finally approved is based on the financial need of the applicant and the availability of funds. Priority is given to students with superior academic backgrounds.

In addition to major educational loans, the University makes special funds available. Short-term emergency loans to a maximum of $100 may be requested by students. The loan must be paid within sixty days, or by the end of the semester, whichever date is earlier. Intermediate loans in amounts not to exceed $500 may be made to help meet special financial needs of students who can demonstrate evidence of interrupted cash flow during an academic year and who can also demonstrate evidence of means of complete repayment during the academic year. Request forms may be obtained from the Student Personnel Office, 130 Student Services Building, Champaign, Illinois 61820.

ACADEMIC AND OTHER REGULATIONS

Responsibility for complying with the regulations of both the Graduate College and the major department and for fulfilling all requirements for the particular degree rests with the student. These requirements are outlined in this catalog and, in many cases, in departmental brochures. A Graduate College calendar, listing specific holidays, deadlines, and other important dates, may be obtained from the Graduate College, 330 Administration Building.

Programs of Study and Areas of Specialization

A student's courses and research are planned with his adviser. Consideration is given to previous academic training, career objective, and the general requirements of the Graduate College and the major department. The student should become familiar with these requirements and satisfy them as soon as possible. Each department determines its own foreign language requirement, if any, or the options that may be substituted. Special courses without graduate credit, designed for students preparing to meet a language requirement, are offered by the language departments.

Work Completed Elsewhere

A candidate for the doctorate who has received a master's degree from a recognized institution is considered to have completed the first stage of a doctoral program (see page 28). If the courses involved are to be used in partial fulfillment for the requirements for the doctorate, the candidate is examined on the content at the time of the preliminary examination.

A student who has completed graduate work in a recognized institution, but has not taken a degree, may petition to obtain credit toward an

advanced degree by passing examinations in this work. Admission to such examinations requires the approval of the departments concerned; acceptance of credit requires the approval of the Graduate College. The acceptance of credit for work completed elsewhere does not reduce the residence requirement for an advanced degree.

Time Limit for Advanced Degrees

A candidate for the master's degree must complete all requirements for the degree within five calendar years after his first registration in the Graduate College.

A candidate for the doctor's degree must complete all requirements for this degree within seven calendar years after his first registration in the Graduate College, except as noted in the following paragraph.

A candidate for the doctorate who has received a master's degree elsewhere must complete all requirements for the degree within five years after his first registration in the Graduate College. A student whose program of study is significantly interrupted after he receives a master's degree from the University of Illinois and who later returns to work for his doctorate will have five years from the date he returns to complete degree requirements.

Unit Credit for Courses

Graduate credit is measured in terms of units. One unit is considered the equivalent of four semester hours. The normal program for a full-time graduate student is four units each semester or two units for an eight-week summer term. With his adviser's approval, the student may take a maximum of five units in a semester, or two and one-half units in a summer term, unless he is employed. Maximum credit loads for employed students are shown on page 26.

Although credit earned by passing proficiency examinations can not be applied to the requirements for an advanced degree, such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in an area considered to be important to the student's program of study. A student should consult his major adviser before applying to take a proficiency examination.

Grading System

Final grades for courses are recorded as follows: A, B, C, D (lowest passing grade), and E (failure), with numerical computations of grade-point averages based on a system where A = 5.0. Other symbols in use, but not included in the computation of grade-point averages, are:
W—Officially withdrawn from a course.

Ex—Temporarily excused. Used by the instructor if he has granted an extension of time to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next semester in which the student is registered or one year from the date the excused grade was incurred if the student does not register. Failure to complete the work within these time periods results in a grade of E.

Df—Grade temporarily deferred. Used only in research courses and other approved courses that extend beyond one semester.

S or U—Satisfactory or Unsatisfactory. Used only as final grades for the thesis research course (499) and in certain approved noncredit courses.

P or F—Pass or Fail. Used only if a graduate student has registered for a course under the pass-fail option with the approval of his major department. See below.

Pass-Fail Option

Subject to the restrictions imposed by the major department, a graduate student with the approval of his adviser may register for graduate credit under this option with the understanding that there must be at least two units of course work on the Urbana-Champaign campus with grades of A through D for every unit taken on a pass-fail basis. Students may elect this option only during advance enrollment, during regular registration days, or within the first two weeks of the term. At any other time, requests to take a course on this basis, or to retain the course and drop the option will not be granted.

Scholastic Requirements

The minimum admission average required by the Graduate College for an advanced degree is 3.75 (A = 5.0), but the average required by the major department may be higher than 3.75. The grade-point average (GPA) is computed at the end of every term and is shown on the Semester Report that is mailed to each student as soon as possible after the final day of examinations. The GPA computation includes only units with grades of A through E. It excludes grades of Pass, Fail, Ex, Df, S, U, and credit for work completed elsewhere. A student who receives a grade of E should consult with his adviser to determine whether he should repeat the course and whether or not the credit he earns in that course, if repeated with a passing grade, may be applied to an advanced degree. Repetition of the course, however,

does not eliminate the original grade of E from the transcript or from the computation of the grade-point average.

A student who has completed four or more units with an average of less than 3.75 receives a warning letter from the Graduate College. If the average has not been raised to 3.75 upon the completion of four additional units, or if the average falls below 3.75 thereafter, the student is disqualified as a degree candidate. Attainments other than satisfactory grades, however, are taken into consideration by the adviser and the major department in determining qualifications for an advanced degree.

Maximum and Minimum Registration

Students holding University Fellowships or other fellowships awarded by the University must carry a full program (four units or the equivalent). Those awarded tuition and fee waivers must carry a minimum program of three units or the equivalent. The academic work carried by assistants and others on the University staff is limited by statute, and those employed outside the University are expected to reduce their programs of study in accordance with these regulations. The maximum amount of academic work is determined by the terms of employment as follows:

	Semester		*Summer Session*
Appointment (Percent)	*Normal Load*	*Maximum Overload Departmental Approval Required*	*Maximum Load Overload not Permitted*
100	1	2	1
75	2	2¾	1¼
67	2¼	3	1½
50	3	3½	1¾
33	3¾	4	2
25	4	4¼	2

Note: Courses taken for semester hours are not included in determining credit loads. The student should not, however, undertake a program so taxing that it will jeopardize his academic record and interfere with the service he is expected to provide in connection with his appointment.

Conferring of Degrees

Advanced degrees are conferred in February, June, August, and October; the doctorate is not awarded in August. No student will be awarded more than two graduate degrees for work completed at the University of Illinois.

THE MASTER'S DEGREE

Unless otherwise specified in the departmental listings, the credit requirement for this degree is at least eight units. Three of the eight units must be in courses numbered in the 400 series, and two of these three must be in the major field.

Residence

A candidate must spend at least two semesters, or the equivalent, in residence and must earn at least half the required units while in residence. A student who is regularly employed outside the Urbana-Champaign community is not considered to be in residence even though he may be registered in a campus course.

Thesis

A student electing or required to write a master's thesis should file the subject of the thesis at the Graduate College, 321 Administration Building, Urbana, Illinois 61801, at least six weeks prior to graduation. No more than three units of thesis credit may be included in an eight-unit program. Credit in thesis research can not be applied to a degree unless a thesis is submitted.

For specific instructions regarding the format of the thesis, the student should obtain a copy of the leaflet *Instructions for Preparation of Theses* from the Graduate College Thesis Office, 315 Administration Building.

Master's Degrees in Teacher Education

Master's degrees in teacher education require at least four units of graduate study in the major field, two units of electives, one unit in educational psychology, and one unit in history and philosophy of education. Detailed information concerning specific requirements within these areas, as approved by the Urbana Council on Teacher Education, may be obtained from appropriate departmental offices and advisers.

A limited number of applicants who have not completed requirements of a four-year undergraduate curriculum leading to teacher certification may be admitted to these programs on the approval of the appropriate adviser and the Coordinator of Teacher Education. Such students must complete teacher certification requirements, as well as the usual program requirements, in order to qualify for the master's degree in teacher education.

In general, the graduate student admitted with certification deficiencies must meet the general education requirements and teaching field

requirements equivalent to those of the appropriate undergraduate curriculum as determined by the adviser. Teacher certification requires a minimum of eighteen semester hours of professional education, including student teaching. Graduate courses in professional education may be applied toward fulfillment of certification requirements.

Students wishing to pursue both certification and master's degree requirements may obtain information from the Office of the Coordinator of Teacher Education, 120 Education Building, Urbana, Illinois 61801.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is offered in nearly all of the departments and divisions. For further information, consult departmental sections. General requirements are described below; special requirements are given in departmental listings. For information about doctoral-level professional degrees in art, education, law, music, and psychology, see the appropriate section.

Residence and Credit Requirements

A doctoral program covers three stages, as defined below, and normally includes at least twenty-four units. Two of these stages, or at least sixteen units, must be completed in residence. A student who is regularly employed outside the Urbana-Champaign community is not considered to be in residence even though he may be registered in a campus course.

The *first stage* ends when the student receives the master's degree or earns the equivalent credit (eight units or thirty-two semester hours); the *second stage* ends when the departmental course and credit requirements have been fulfilled and the student has passed the preliminary examination; the *third stage* is devoted to research, seminars, the dissertation, and the final examination. During all three stages the student is expected to register for a full program or, if employed, for the maximum credit allowed under the terms of his appointment.

Candidates in the third stage must continue to register each semester until the dissertation is deposited in the Graduate College. Candidates who are in absentia register for at least one unit each semester until the dissertation is completed or the minimum credit requirement of twenty-four units has been met, whichever comes first. If the credit

requirement is fulfilled before the dissertation is completed, the candidate in absentia may register in 499 for zero credit.

Doctoral Examinations

To enter the third stage of a doctoral program (see above), a candidate must pass a preliminary examination to test his qualifications for further advanced study and research. The examination may be written, oral, or both, according to departmental requirements. The candidate is certified for admission to the third stage by a committee appointed by the Dean of the Graduate College on the recommendation of the executive officer of the major department. To maintain his status as a degree candidate, a student who has passed the preliminary examination must register each regular semester until the degree is conferred. If a student does not complete his degree requirements within five years after passing his preliminary examination, a second preliminary examination is required.

The candidate is admitted to the final examination by the Dean of the Graduate College upon completion of the dissertation and the recommendation of the major department.

Thesis

The Doctor of Philosophy is primarily a research degree, and the candidate must demonstrate his capacity for independent research by the production of an original thesis on a topic within his major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination.

Candidates engaged in thesis research may find it desirable or expedient to publish, prior to the conferral of the degree, certain findings that later will be incorporated in the dissertation. In this case appropriate acknowledgment of the earlier publication should be included in the dissertation. The Graduate College encourages such publication, but the thesis in its entirety may not be published before all degree requirements have been completed.

Directions regarding the thesis are given in the leaflet *Instructions for Preparation of Theses* which may be obtained in the Graduate College Thesis Office, 315 Administration Building.

INTERDISCIPLINARY PROGRAMS

As the prospective applicant surveys the various programs described in this text, he may wish also to examine programs in related fields. The graduate student at the University of Illinois, in consultation with his adviser, may define areas of concentration shaped to fit his particular needs and interests. It is possible to combine courses and specializations in fields other than the student's major field. A number of interdisciplinary programs are here described, including population studies, Romance linguistics, environmental studies, neurosciences, plant physiology, and applied mathematics. However, an unlimited number of individually designed programs of study may be arranged to provide interdisciplinary approaches to specific objectives.

OTHER EDUCATIONAL OPPORTUNITIES

CIC Traveling Scholar Program

The Committee on Institutional Cooperation (CIC), a voluntary association of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its continuing effort to increase cooperative use of its member institutions' resources. The program enables doctoral-level students to spend a semester at another CIC institution in order to take advantage of special course offerings, laboratory facilities, or library collections not available at his own institution. Visits of Traveling Scholars are limited to one semester or two quarters. Traveling Scholars register and pay regular fees at the home institution. Credit earned while on this program is automatically accepted by the home university.

Application forms are available in the Graduate College, 330 Administration Building, Urbana, Illinois 61801.

International Programs and Studies

The University of Illinois offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate student research forms an integral part of University projects in India, Sierra Leone, Jamaica, Iran, Puerto Rico, Tunisia, and other countries. Research opportunities, particularly in non-Western countries, are also available through the Midwest Universities Consortium for International Activities, of which the University of Illinois is one of the five member universities, and the Center for International

Comparative Studies on the Urbana-Champaign campus. For full information on these opportunities, as well as other graduate study abroad programs and a wide range of courses and seminars in international studies, please write for the handbook "International Programs and Studies at the University of Illinois at Urbana-Champaign," which may be obtained from the Office of International Programs and Studies, 309 Illini Tower, 409 East Chalmers Street, Champaign, Illinois 61820.

Three curricula have overseas teaching options. As part of the master's degree in the teaching of mathematics or science, an internship is offered in Puerto Rico for one academic year. For information about either the science or mathematics option, please contact Professor Kenneth Travers, 379 Education Building, Urbana, Illinois 61801. An option including an internship in Puerto Rico (eleven months) or Iran (two years) has been added to the curriculum leading to the Master of Arts in the Teaching of English as a Second Language. Information is available from the Director of Programs in English as a Second Language, 3070c Foreign Languages Building, Urbana, Illinois 61801. Positions teaching English for one academic year at secondary schools in Austria are available to graduates and graduate students. To obtain detailed information, contact the Department of Germanic Languages and Literatures, 3072 Foreign Languages Building, Urbana, Illinois 61801.

Extramural Courses

Graduate courses in several areas of study are available at various centers throughout the state. Students who are employed full time and who wish to register for more than one unit during a semester should obtain approval from their academic adviser and from their supervisor or other appropriate administrative officer where they are employed.

Credit earned in extramural courses is not considered work in residence. Candidates for certain degrees, however, may apply up to four units toward the master's degree for credit earned in the extramural program if other University requirements have been met and approval for courses pursued is secured from the major department. Courses at the 400 level are not open to undergraduate students for credit.

Correspondence Courses

Credit earned in correspondence courses can not be applied toward

an advanced degree. However, it is possible to fulfill certain prerequisites or remove deficiencies through correspondence work. A catalog of correspondence courses offered by the University of Illinois may be obtained from the Division of University Extension, Correspondence Courses, 104 Illini Hall, Champaign, Illinois 61820.

HOUSING

The University of Illinois is committed to a policy of nondiscrimination in housing with respect to race, religion, and national origin. University-owned housing facilities are operated on this basis. Privately owned housing which is University approved or listed must also be operated in compliance with this policy. The owner or manager of this type of housing files with the University Housing Division a pledge not to discriminate on the grounds of race, religion, or national origin. A Housing Review Committee has been appointed by the Chancellor to assist in the implementation and enforcement of nondiscrimination in housing.

If anyone has reason to believe that an owner or manager of certified housing has refused or failed to rent to an individual because of the individual's race, religion, or national origin, he should communicate this information directly to the secretary of the Housing Review Committee or to any member of the committee. The secretary can be reached at 333-0613. The individual who alleges discrimination need not be University affiliated; furthermore, the particular rental unit involved in the alleged discrimination need not be one that is listed with the University, provided that the owner or manager has a nondiscriminatory pledge on file.

The University has residence facilities in Arthur Hill Daniels Hall and Stuart Pratt Sherman Hall, two separate residence hall complexes for approximately 1,000 single graduate students, both men and women. Semester contract food service in undergraduate dining halls can also be arranged. In addition, the University provides a limited number of apartments for married students, with priority in assignment given to families demonstrating financial need.

Applications for accommodations in the University graduate residence halls or the University-owned apartments for married students may be obtained from the Housing Information Office, 420 Student Services Building, Champaign, Illinois 61820. The Housing Information Office also maintains a courtesy list of private apartments and rooms available in homes in the community.

Daniels Hall and Sherman Hall, the two graduate residence halls operated by the University, offer accommodations in single and double rooms. The rates for the academic years 1972-1973 and 1973-1974 are given here:

Daniels Hall	*1972-1973*	*1973-1974*	*Sherman Hall*	*1972-1973*	*1973-1974*
Single	$553	$578	Single	$649	$674
Double	$489	$514	Double	$617	$642

A board contract may be purchased for $317.50 per semester.

Monthly rentals for University-owned furnished sleeping rooms and apartments for married students range from $72 to $117 per month, utilities included.

TUITION AND FEES

Since these fees are subject to change, specific information is not given here. More recent and detailed information concerning tuition charges, regular and special fees, exceptions, and refunds are available in a leaflet that may be obtained from the Office of Admissions and Records, 100a Administration Building, Urbana, Illinois 61801.

In general, however, the fees assessed a resident of Illinois, including tuition, the service fee, and the hospital-medical-surgical fee, will range each semester from about $145 for Range III (credit load to one and one-fourth unit) to approximately $340 for Range I (three units or more). Students who are not residents of Illinois will pay from about $310 to $835 for the same credit loads. Tuition and fees for the eight-week summer term are approximately half of those for a full semester.

Tuition and the service fee are waived for all academic employees of the University on appointment for at least 25 percent time but not more than 67 percent time, and for certain nonacademic employees. The nonresident portion of tuition and the service fee are waived for academic and administrative staff members on appointment with the University for 68 percent time or more. Students who hold fellowships, traineeships, or other grants that provide similar exemptions will be informed of fee exemptions at the time the award is offered.

The nonresident portion of tuition is waived for the spouses and dependent children of all staff members on appointment with the University at least 25 percent time.

Rules regulating these and other exemptions from tuition, or fees, or the nonresident portion of tuition are listed in the leaflet referred to above.

Programs of Study

The graduate programs offered by the divisions, schools, institutes, centers, and departments of the Urbana-Champaign campus of the University of Illinois are described in the following pages; areas of specialization within these programs and requirements for admission to them are included. For information concerning interdisciplinary programs, see page 30.

In the departmental sections, frequent reference is made to the *admission average;* this academic average is calculated from the last sixty hours of undergraduate work, but does not include any course work taken before the beginning of the junior year. Averages are based on a scale in which the grade of A equals 5.0. Applicants with ungraded transcripts must submit supporting documents (see page 18). The 300-level courses mentioned in the text are courses for advanced undergraduates and graduate students; 400-level courses are open to graduate students only.

The University publishes every two years the *Courses Catalog* which lists all the undergraduate and graduate courses offered at this campus. A listing of the courses offered each term is published in the *Time Table,* which is issued in April for the fall term, in May for the summer term, and in November for the spring term. Copies of these publications may be procured by writing to individual departments, which also issue brochures describing in detail the features of their programs, or by writing the Graduate College, 330 Administration Building, Urbana, Illinois 61801.

ACCOUNTANCY

Head and Director of Graduate Studies: E. J. DeMaris
Correspondence and Information: Head of the Department of Accountancy, University of Illinois, 360 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: N. M. Bedford, G. D. Brighton, E. J. DeMaris, R. I. Dickey, C. F. Dunham, P. E. Fess, H. P. Holzer, D. Litherland, K. W. Perry, H. M. Schoenfeld, D. H. Skadden, W. E. Thomas, V. K. Zimmerman
Associate Professors: J. W. Deskins, E. L. Elliott, F. L. Neumann
Assistant Professors: D. L. Jensen, J. C. McKeown, W. J. Morse, S. Yu

Graduate Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science and Doctor of Philosophy. For graduates of business schools with credit in appropriate undergraduate courses, the M.A.S. degree requirements can be completed in one year. For nonbusiness graduates, the M.A.S. can be earned in two years. The Ph.D. degree takes approximately two years of full-time study and research beyond the M.A.S.

Admission. The admission average required in accountancy is 4.0. Applicants with averages between 3.75 and 4.0 are considered on an individual basis. All applicants, native or foreign, are required to take the Admission Test for Graduate Study in Business. This test should be taken early enough to insure that the results will be available to the department prior to action on admission.

Master of Accounting Science. All candidates take three specified graduate-level courses in accountancy and a graduate-level course in both economic theory and organization theory. No thesis is required, although the student may elect to write one. Courses in linear algebra, operations research, and computer programming and applications must be taken, if such courses were not taken in prior academic work.

A candidate with undergraduate background in accounting is required to complete at least eight units of work, four of which must be in accountancy. Such a student should have completed an equivalent of the undergraduate curriculum at the University of Illinois at Urbana-Champaign, including twenty hours of undergraduate work in accounting, introductory courses in economic theory and the functional fields of business, two courses in statistics, and courses in finite mathematics and calculus. He may take graduate courses for credit to satisfy these requirements.

A student with little or no business and accounting background is required to complete sixteen units of work. In his first year he takes four specified graduate courses in accountancy. Depending upon his background, he also enrolls in courses in statistics, business economics, operations research, business organization, calculus, and decision theory. A student who believes he already meets some of the requirements of the two-year program is given the opportunity to substitute elective courses for areas in which he can satisfactorily demonstrate his proficiency. In his second year, he follows the requirements for all M.A.S. students, as described above.

Adequate provisions have been made for electives suited to the particular interests of both one-year and two-year M.A.S. students.

Doctor of Philosophy. A candidate for the Doctor of Philosophy degree must have his admission approved by the departmental admissions committee, which may require an oral or written examination.

The requirements for the Doctor of Philosophy degree include a master's degree; course work equivalent to that required for the M.A.S. degree; credit in micro- and macro-economics; a minor or minors of at least four units other than accountancy; at least eight units of accountancy, including one specified unit in accountancy, or equivalent (not less than six of these eight units must be taken for graduate credit at the University of Illinois at Urbana-Champaign); and additional units to bring the total to at least twenty-four, including the eight units allowed for a master's degree. Eight of the twenty-four must be doctoral dissertation units. The student's doctoral program is determined in consultation with his faculty adviser. The student's tentative plans for the doctoral dissertation serve as a guidepost in planning the program.

In addition to the major and minor requirements above, the candidate must satisfy a nonbusiness field requirement and must pass an oral and written preliminary examination and an oral final examination on his doctoral dissertation. In his preliminary examinations, the candidate must demonstrate a thorough knowledge of accounting theory and of the areas of accountancy in which he specialized, a general acquaintance with the subject matter and bibliography of other areas of accountancy, and proficiency in his minor fields and in the required areas of economic theory, quantitative methods, and organization theory.

More information concerning these programs can be found in the departmental publication *Graduate Programs in Accountancy.*

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively a constituent part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to assist accounting faculty and able students from other countries to come to the University of Illinois for study and research in accountancy. The staff of the center, composed of outstanding teachers and researchers from foreign countries, also conducts seminars and courses for graduate credit.

Inquiries concerning the center should be directed to: Professor V. K. Zimmerman, Director, Center for International Education and Research in Accounting, 320 Commerce Building (West), Champaign, Illinois 61820.

ADVERTISING

Head of the Department: S. Watson Dunn
Correspondence and Information: Head of the Department of Advertising, University of Illinois, 103 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: A. M. Barban, S. W. Dunn, N. Wedding
Assistant Professors: R. N. Nielsen, K. B. Rotzoll, S. J. F. Unwin, G. E. White

Graduate Program. The Department of Advertising offers graduate work leading to the Master of Science in Advertising. For the program leading to the Doctor of Philosophy in Communications, see page 57.

Admission and Aid. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an institution of recognized standing. An admission average of at least 4.0 is normally required. Ap-

plicants with averages below 4.0 are considered on an individual basis. All applicants are urged to take either the Graduate Record Examination or the Admission Test for Graduate Study in Business and to attach to their application a short essay indicating why they want to take graduate work in advertising. Financial aid is available to students in the form of fellowships, research and teaching assistantships, waivers of tuition and fees, and long-term loans.

Master of Science. Most students, either with or without an undergraduate major in advertising, can usually earn the Master of Science degree in one calendar year of study. Registration must include a minimum of four units in advertising including at least three units in 400-level courses. At least two units of nonadvertising courses are required. The total minimum requirement is eight units with thesis or nine units without thesis, provided that at least four such units be in 400-level courses.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Head of the Department: H. S. Stillwell
Director of Graduate Studies: H. H. Hilton
Correspondence and Information: Director of Graduate Studies, Department of Aeronautical and Astronautical Engineering, University of Illinois, 101 Transportation Building, Urbana, Illinois 61801

FACULTY

Professors: C. E. Bond, H. H. Hilton, H. W. Knoebel, Y. K. Lin, R. W. McCloy, A. I. Ormsbee, S. N. Roscoe, H. S. Stillwell, R. A. Strehlow, S. M. Yen, A. R. Zak
Associate Professors: H. O. Barthel, L. H. Sentman, K. R. Sivier
Assistant Professor: J. E. Prussing

Graduate Programs. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Students interested in mass transportation and deep sea submergence vehicles, for example, find the graduate study in this department very applicable. Typical areas of concentration are aerodynamics, aeroelasticity, space mechanics, flight mechanics, propulsion, structural mechanics, optimization and control, manual control and display systems, human factors in aerospace systems, and air and noise pollution.

Admission and Aid. The minimum admission average is 4.0. Applications of students with averages below 4.0 but above 3.75 are considered on an individual basis. The prerequisite for graduate study normally is the equivalent of the undergraduate courses required at the University of Illinois for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study. Financial aid is available in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Science. Candidates for the degree of Master of Science are required to complete a minimum of eight units of graduate work, including a thesis. It is possible for a student with a one-half time appointment to complete the require-

ments for the M.S. degree in two regular semesters and a summer session, or three regular semesters.

Doctor of Philosophy. Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for a major in the program of study leading to the degree of Doctor of Philosophy. Each student plans his study program in consultation with a departmental adviser. Courses offered by departments other than aeronautical and astronautical engineering may be included in the major area of study when these courses are of particular value to the work which students desire to emphasize. The major and minor programs must meet with the approval of the head of the department. A reading knowledge of one foreign language is required. For information concerning applied mathematics, see page 97.

AGRICULTURAL ECONOMICS

Head of the Department: Richard L. Feltner
Correspondence and Information: Head of the Department of Agricultural Economics, University of Illinois, 304 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: C. B. Baker, G. K. Brinegar, E. E. Broadbent, B. L. Brooks, F. Dovring, J. Due, R. L. Feltner, F. C. Fliegel, H. G. Halcrow, T. A. Hieronymus, J. M. Holcomb, G. G. Judge, R. A. Kelly, N. G. P. Krausz, A. G. Mueller, R. J. Mutti, F. J. Reiss, J. R. Roush, S. C. Schmidt, H. J. Schweitzer, J. T. Scott, R. G. F. Spitze, E. R. Swanson, T. Takayama, W. N. Thompson, R. N. Van Arsdall, V. I. West
Associate Professors: D. E. Erickson, L. P. Fettig, H. D. Guither, J. W. Gruebele, A. G. Harms, L. D. Hill, R. A. Hinton, M. B. Kirtley, J. W. Robinson, M. M. Wagner
Assistant Professors: C. A. Bock, R. W. Herdt, G. L. Karr, E. D. Kellogg, R. M. Leuthold, W. D. Seitz, A. J. Sofranko, J. C. van Es

Programs and Fields of Study. The Department of Agricultural Economics offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Study programs can be organized with concentrations in production economics and resource organization; agricultural marketing and prices; agricultural economic policy; firm management and decision making; agricultural finance; quantitative methods and research methodology; international agricultural development; natural resource economics and regional development; international trade; rural sociology; and agricultural law.

Admission Requirements. The admission average required is 4.0. Applicants with averages below 4.0 but above 3.75 are considered on an individual basis. Students having less than twelve hours of agricultural economics and economics may be required to take additional courses to adequately prepare them for graduate study. Students who desire to specialize in rural sociology should have had a minimum of six hours of sociology.

Financial Aid. Fellowships, research assistantships, and tuition and fee waivers are available to a limited number of students and are offered on a competitive basis.

Master of Science. Two units in economics, at least one of which must be eco-

nomic theory, and a minimum of four units of agricultural economics, including thesis credit, are required. At least three units must be in 400-level courses, two of which must be in agricultural economics. No more than two units from thesis credit may be included in the minimal eight-unit program. The thesis may be waived under certain conditions. The program is designed to be completed in one year of full-time study.

Doctor of Philosophy. The doctoral candidate must complete eight units of non-thesis courses beyond the M.S. degree. His total graduate program must include a minimum of three units in economics, including one unit each of micro and macro theory, both at the 400 level, and two and one-half units in quantitative methods and research methodology. The student must pass written and oral preliminary examinations, submit an acceptable dissertation, and pass a final oral examination. Foreign languages are not required.

For further information and a copy of the graduate program brochure, write to the address above.

AGRICULTURAL EDUCATION

Chairman of the Agricultural Education Division, College of Education: Paul E. Hemp
Assistant Dean, College of Agriculture: Cecil D. Smith
Correspondence and Information: Division of Agricultural Education, University of Illinois, 357 Education Building, Urbana, Illinois 61801

FACULTY

Professors: P. E. Hemp, L. J. Phipps
Associate Professor: R. W. Walker
Assistant Professors: H. B. Thomas, D. L. Williams

Graduate Programs. The Master of Science in Agricultural Education has been planned as a fifth year of work for students who have completed the requirements of the four-year agriculture curriculum for secondary teachers of agricultural occupations, or its equivalent.

Admission. The admission average is 3.5. The program is open only to students who have met the requirements for teaching agriculture.

Master of Science. Candidates must earn four units in agriculture, two units in education, and two units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields.

A minimum of four units must be taken in residence. A maximum of four of the required eight units may be earned in extramural courses offered by the University of Illinois; of these four units, no more than two units may be in agriculture and no more than two units may be in education.

In order to fulfill one of the objectives of this program, that of broad general training in technical agriculture at the graduate level, the agriculture courses and electives must be selected with the approval of the adviser. In general, agriculture courses are selected from at least three subject-matter departments with no more than three units from any department.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for the Department of Vocational and Technical Education in the College of Education.

AGRICULTURAL ENGINEERING

Head of the Department: Frank B. Lanham
Correspondence and Information: Head of the Department, Department of Agricultural Engineering, University of Illinois, 245 Agricultural Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: B. J. Butler, J. O. Curtis, D. L. Day, E. L. Hansen, R. C. Hay, D. R. Hunt, B. A. Jones, Jr., F. B. Lanham, J. W. Matthews, E. F. Olver, G. C. Shove, J. A. Weber, R. R. Yoerger
Associate Professors: R. F. Espenschied, W. D. Lembke, H. B. Puckett, E. D. Rodda, J. C. Siemens
Assistant Professors: G. E. Hall, D. L. Hoag, J. K. Mitchell, W. R. Nave

Graduate Programs. The Department of Agricultural Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees with a major in agricultural engineering. The student may specialize in power and machinery (soil dynamics, tillage, noise and vibration, vehicle stability, operations analysis, pesticide application, and harvesting efficiency); soil and water mechanics (hydraulics of structures, agricultural hydrology, drainage, mechanics of erosion, and water resources planning); farm structures (structural analysis and design, environmental control, air contaminates, and waste disposal); or processing (systems analysis for farmstead mechanization, crop conditioning and processing, and physical properties of agricultural products).

Admission and Aid. The admission average required is 4.0; however, applications of those with averages below 4.0 but above 3.75 are reviewed individually by the departmental graduate committee and admission may be recommended if credentials are satisfactory. Financial aid is usually available in the form of fellowships, assistantships, and waivers of tuition and fees.

Requirements. Candidates must have completed the equivalent of the undergraduate curriculum at the University of Illinois. Candidates for the Doctor of Philosophy must fulfill all the standard requirements of the Graduate College. The program provides for a major in agricultural engineering with a minor in other graduate departments of engineering, mathematics, physics, including soil physics, or other disciplines in the physical sciences.

Opportunity for independent study and research is an important part of both the Master of Science and the Doctor of Philosophy programs. Research opportunities are available in both the Agricultural and Engineering Experiment Stations. For the master's degree, a thesis involving an analytical or experimental investigation and satisfying about one-fourth of the credit for the program is normally required.

AGRONOMY

Head of the Department: Robert W. Howell
Correspondence and Information: Head, Department of Agronomy, University of Illinois, W-201 Turner Hall, Urbana, Illinois 61801

FACULTY

Professors: S. R. Aldrich, D. E. Alexander, A. H. Beavers, R. L. Bernard,

C. M. Brown, A. W. Burger, S. G. Carmer, J. M. J. de Wet, J. W. Dudley, E. B. Earley, J. B. Fehrenbacher, J. E. Gieseking, J. W. Gerdemann, D. W. Graffis, H. H. Hadley, R. H. Hageman, J. B. Hanson, J. R. Harlan, C. N. Hittle, A. L. Hooker, R W. Howell, J. A. Jackobs, R. W. Jugenheimer, E. L. Knake, L. T. Kurtz, J. R. Laughnan, E. R. Leng, S. W. Melsted, D. A. Miller, R. J. Miller, R. T. Odell, D. B. Peters, M. B. Russell, W. O. Scott, R. D. Seif, F. W. Slife, F. J. Stevenson, M. D. Thorne, E. H. Tyner, L. F. Welch

Associate Professors: J. D. Alexander, J. S. Boyer, R. L. Cooper, L. E. Gard, R. C. Hiltibran, R. L. Jones, R. J. Lambert, M. D. McGlamery, G. E. McKibben, W. R. Oschwald, T. R. Peck, B. W. Ray, R. W. Rinne, E. C. A. Runge, W. M. Walker, L. M. Wax, C. M. Wilson, J. T. Woolley

Assistant Professors: C. W. Boast, O. C. Braids, J. E. Harper, J. J. Hassett, T. D. Hinesly, T. Hymowitz, D. E. Koeppe, W. L. Ogren, E. B. Patterson, E. R. Perrier, E. W. Stoller, E. J. Weber, J. M. Widholm

Graduate Programs. The Department of Agronomy offers graduate work leading to the Master of Science and Doctor of Philosophy. The student may specialize in crops (breeding and genetics, evolution, production, morphological development, physiology, plant chemistry, weeds and their control); soils (biology, chemistry and biochemistry, fertility, genesis, morphology and classification, management, physical and colloidal chemistry, physical edaphology, physics); or biometry.

Admission. The student must show promise of achievement in his chosen field, must have an admission average of 3.75 or higher, and must be approved by the Department of Agronomy. Students having averages below 4.0 but above 3.75 must have unusually strong training in the basic sciences to be considered for admission.

Adequate preparation for graduate work in soils includes courses in physics, chemistry, geology, microbiology, and mathematics; in crops, courses in botany, chemistry, genetics, and statistics; in biometry, courses in mathematics, statistics, and computer programming.

Master of Science. A candidate must present an acceptable thesis, unless this requirement is waived by petition, and pass an oral examination.

Doctor of Philosophy. A candidate must complete a minimum of twenty-four units of graduate study and fulfill the language requirement or its substitute. At least four units of 300- or 400-level courses outside the Department of Agronomy are required.

ANIMAL SCIENCE

Head and Graduate Supervisor: D. E. Becker

Correspondence and Information: Head of the Department, Department of Animal Science, University of Illinois, 328 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: D. E. Becker, O. G. Bentley, D. J. Bray, P. J. Dziuk, R. M. Forbes, U. S. Garrigus, E. E. Hatfield, A. H. Jensen, J. Kastelic, S. P. Mistry, A. V. Nalbandov, A. L. Neumann, H. W. Norton, B. A. Rasmusen

Associate Professors: W. W. Albert, D. H. Baker, B. G. Harmon, F. C. Hinds

Assistant Professors: S. E. Curtis, D. E. Johnson, T. G. Lohman, F. N. Owens, R. M. Robson, J. R. Romans, G. R. Schmidt

Graduate Program. The Department of Animal Science offers graduate work leading to the Master of Science and Doctor of Philosophy. Study and research may be pursued in the following areas of specialization: population and immunogenetics; physiology of reproduction including endocrinology; environmental physiology; animal nutrition; nutritional biochemistry; meat science and muscle biology; and world animal agriculture. In addition, a student who expects to terminate the graduate program at the master's level may pursue work in animal management or production. Beef cattle, horses, poultry, sheep, swine, and a wide variety of laboratory animals are available for study.

Admission and Aid. Students are admitted with full standing if they have an admission average of 4.0. Applications of students with averages below 4.0 but above 3.75 are considered on an individual basis. Courses in biological and physical sciences and mathematics are essential preparation for graduate work in any specialized area of animal science. Candidates specializing in the areas of animal nutrition or nutritional biochemistry must have training equivalent to one five-hour course each in quantitative analysis and organic chemistry; a course in physical chemistry is strongly recommended. Candidates specializing in meat science should have undergraduate training in meat evaluation, use, and/or processing, and in microbiology. Students lacking adequate background to register in graduate courses at the University of Illinois are expected to remove course deficiencies during the first year of graduate study. The department desires applicants with a strong undergraduate degree in animal science and with real promise of completing degree requirements in reasonable time. Financial aid is available to a limited number of students in the form of fellowships, traineeships, and teaching and research assistantships.

ANTHROPOLOGY

Head of the Department: David W. Plath
Director of Graduate Studies: F. K. Lehman
Correspondence and Information: Graduate Secretary, Department of Anthropology, University of Illinois, 109 Davenport Hall, Urbana, Illinois 61801

FACULTY

Professors: E. M. Bruner, J. B. Casagrande, H. A. Gould, D. W. Lathrap, F. K. Lehman, J. C. McGregor, B. Nettl, D. W. Plath, D. B. Shimkin, V. Uchendu
Associate Professors: D. Butterworth, C. E. Cunningham, E. Giles, D. C. Grove, N. E. Whitten, R. T. Zuidema
Assistant Professors: C. J. Bareis, G. E. Gibbon, C. M. Keller, H. M. Ross, E. Schildkrout

Graduate Programs. The Department of Anthropology offers work leading to the degrees of Master of Arts and Doctor of Philosophy. The master's degree can be a first stage toward the doctorate or can be used by students wishing ultimately to apply a knowledge of anthropology in some related field. The doctoral program is designed primarily to train scholars and teachers of the subject but also increasingly to prepare professionals to work in nonacademic contexts; the mas-

ter's degree is not required of all students going on to the doctorate. Courses and guided study provide broad coverage with concentration in the ethnology of Latin America, aboriginal North America, Japan, China, Indonesia, South and Southeast Asia, Africa south of the Sahara, and Oceania; cultural, historical, and archaeological methods; culture change and modernization in complex societies; urban anthropology; human ecology, structural, and formal analysis of cultural systems; and ethnolinguistics and ethnomusicology. Relevant courses are offered in other fields, such as linguistics, history, sociology, geography, agricultural economics, life sciences, and preventive medicine. The department also helps support student attendance at field schools and study in mathematics, languages, and related subjects at summer institutes.

Opportunities for original research in the field, laboratory, and library include participation in faculty research projects, attendance at University of Illinois archaeological and ethnological field schools held every summer, as well as independent graduate student research in the United States and abroad. Library and computer facilities on campus are outstanding.

Admission. Applicants as first-year graduate students must have an admission average of 4.0. Exceptions may be made for those who have a grade-point average between 3.5 and 4.0 if the student has special skills or experience relevant to the study of anthropology. A student without the equivalent of this department's undergraduate major may be permitted to register for graduate courses but will be required to make up any deficiencies in this background.

Master of Arts. A candidate for the master's degree must accumulate at least eight units of graduate credit and present an acceptable thesis or essay in lieu of thesis. The degree should be earned in not more than two years.

Doctor of Philosophy. A candidate for the doctor's degree must take at least eight units beyond those for the master's and must present a predoctoral research paper of substantially original content before his preliminary examinations. He will then undertake extended original research leading to a thesis, which is defended for the degree. The doctoral degree normally takes from four to six years to earn. The student must demonstrate ability to use for scholarly purposes either one foreign language at a high level of proficiency or two at ordinary reading proficiency. The level to be tested and languages will be chosen by the student's advisory committee, which is appointed early in the student's second year of residence.

ARCHITECTURE

(Including Architectural Engineering)

Head of the Department: J. H. Swing
Correspondence and Information: Graduate Program, Department of Architecture, University of Illinois, 104 Architecture Building, Champaign, Illinois 61820

FACULTY

Professors: J. S. Baker, L. J. Brightbill, G. T. Clayton, P. H. Coy, W. L. Creese, W. Eng, W. L. Fash, H. L. Hornbeak, R. A. Jones, R. D. Katz, S. T. Lanford, W. H. Lewis, R. P. Link, C. B. Looker, A. Notaras, W. J. O'Connell, J. G. Replinger, I. Schousboe, R. J. Smith, J. H. Swing, S. J. Y. Tang, C. A. Winkelhake, H. C. Young

Associate Professors: V. V. Cafourek, G. Exline, G. Francescato, G. V. Trieschmann, H. C. White
Assistant Professors: E. E. Flynn, B. B. Kesner

Graduate Programs. Until the fall semester of 1973 the Department of Architecture will offer to entering students graduate work leading to either of two degrees, the Master of Architecture or the Master of Science in Architectural Engineering. Each of these degrees requires a one-year graduate program and is preceded by a five-year program of undergraduate study. Beginning in the fall of 1973 the Department of Architecture will offer to entering students graduate work leading to a single degree with options, the Master of Architecture. This is a two-year degree and is preceded by a four-year program of undergraduate study. Areas of concentration include architectural administration and building construction; architectural design, including advocacy, behavior and environment, criticism, environmental education, housing, industrialized buildings, methodology, theory, transportation, and urban design; history of architecture; and structural theory and design. A student's program will embrace either a recommended curriculum in one of the areas of concentration or an individual curriculum planned in consultation with a faculty adviser.

Admission. An admission average of 3.75 is required; upon petition by the applicant, the department will consider an individual whose average is less than 3.75 but more than 3.5. A student wishing to specialize in design must submit a portfolio of his work.

Master of Architecture and Master of Science in Architectural Engineering. Available until fall 1973. Admission to either of these programs requires a baccalaureate degree in architecture equivalent in scope and standards to the five-year program given by the University of Illinois. The course requirements of the master's program is eight academic units; the residence requirement is two semesters. Inadequacies in preparation, duties required for graduate assistantships, or other circumstances may extend the period of residence.

Master of Architecture. Available fall 1973. The degree of Master of Architecture will be offered under one of the following options: architectural administration and building construction; architectural design; architectural history and preservation; structures; and urban design. Admission will require a baccalaureate degree in architectural studies or in architecture equivalent to the four-year program at the University of Illinois. The M.Arch. degree will demand the successful completion of fifteen and one-half academic units in one of the program options and four semesters of residence. Inadequacies in preparation, duties required for graduate assistantships, or other circumstances may extend the period of residence.

ART AND DESIGN

(Including Art Education, Art History, Graphic and Industrial Design, Painting and Printmaking, and Sculpture)

Head of the Department: James R. Shipley
Associate Head: E. C. Wicks
Coordinator of Graduate Programs: Harold A. Schultz
Correspondence and Information: Coordinator of Graduate Programs in Art, Department of Art and Design, University of Illinois, 140 Fine Arts Building, Champaign, Illinois 61820

FACULTY

Professors: E. H. Betts, C. W. Briggs, P. Fehl, D. E. Frith, F. Gallo, K. M. Lansing, A. D. Moore, A. Perkins, R. Perlman, L. H. Price, E. C. Rae, H. A. Schultz, J. R. Shipley, A. R. Sinsabaugh, M. A. Sprague, R. W. Sterkel, R. A. von Neumann, A. S. Weller, E. C. Wicks, E. J. Zagorski, J. Ziff

Associate Professors: P. Bodnar, M. Franciscono, F. E. Gunter, G. W. Hardiman, N. McFarland, R. Moses, K. Munakata, M. Pinnell, D. M. Rowan, J. A. Savage

Assistant Professors: M. D. Hilson, T. G. Kovacs, E. Lancaster, T. Zernich

Graduate Programs. The Department of Art and Design offers graduate work leading to the Master of Arts in Art Education and in Art History; the Master of Fine Arts in Design (Industrial Design and Graphic Design), in Painting and Printmaking, and in Sculpture; the Doctor of Education in Art Education; and the Doctor of Philosophy in Art History.

Admission and Aid. For admission to the master's programs, the applicant must have an admission average of 3.5. Applicants are expected to have completed an undergraduate program similar to that established at this University, with a major in the area to be pursued in graduate study. Those intending to major in art education must have (or be eligible for) a teaching certificate in that field. Applicants for admission to the M.F.A. programs are required to submit a portfolio of examples of their creative work.

Admission to the Doctor of Education in Art Education program requires a master's degree in fine arts or art education, or the equivalent from an accredited institution as well as a minimum of two years of acceptable teaching experience. Final approval for admission is determined by examinations administered by the Department of Art and Design and the College of Education.

Applicants for admission to the Doctor of Philosophy in Art History must hold a master's degree in art history, or its equivalent, from an accredited institution. Final approval for admission is determined by the Graduate Committee in History of Art and Architecture.

Preference is given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and tuition and fee waivers.

Master of Arts. A candidate for the A.M. in Art Education or Art History must spend at least two semesters or the equivalent in residence. Satisfactory completion of eight units of course work is necessary for the degree. A reading knowledge of French or German, successful completion of a comprehensive examination, and a thesis or scholarly paper are required in art history. No thesis is required in art education.

Master of Fine Arts. Satisfactory completion of sixteen units of course work is necessary for the degree. A candidate must spend a minimum of four semesters in residence. A thesis in the form of creative work in the major field of concentration and a written report are required.

Doctoral Degree Programs. A minimum of sixteen units of course work beyond the master's degree is required. There are three formal examinations: the qualifying, preliminary, and final examinations, which are taken at various stages of the student's progress. A thesis is required and all Graduate College regulations covering its preparation, submission, and publication must be met. Students usually require from three to five years to complete the degree requirements.

ASIAN STUDIES

(Including Burmese, Chinese, Indonesian, Japanese, Korean, Persian, and Sanskrit)

Director: Robert B. Crawford
Associate Director (South and West Asia): Harold A. Gould
Graduate Supervisor: William L. MacDonald
Correspondence and Information: William L. MacDonald, Graduate Supervisor, Center for Asian Studies, University of Illinois, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: E. Brunner, R. Crawford, C. E. Dawn, L. Eastman, F. Fliegel, H. Gould, W. Heinrichs, N. Jacobs, F. Foster, W. Buddemeier, B. Kachru, Y. Kachru, F. K. Lehman, B. Nettl, A. Peshkin, A. Perkins, D. Plath, A. Ringer, P. Schran, K. Taira, G. L. Tikku, E. Wolff, G. Yu, B. Karsh
Associate Professors: R. Chang, H. Choldin, S. Cohen, C. Cunningham, S. Douglas, S. Makino, K. Munakata, M. Weinstein, M. Weinbaum, C. Kim, B. Kling
Assistant Professors: S. Anacker, C. Cheng, E. Eide, K. Gould, T. Hymowitz, W. MacDonald, W. Maxwell, S. Sato, M. Shorish, H. Wechsler, P. Wiebe

Program. The Center for Asian Studies offers a two-year program of language and area courses leading to the Master of Arts in Asian Studies with regional concentrations in East Asia, Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for those intending to proceed to the Ph.D. in a related field and for those preparing for careers not requiring the doctorate. The Center for Asian Studies also administers a graduate minor in Asian studies in cooperation with various departments, allowing a graduate student electing this minor to concentrate on East Asia, Middle East, South Asia, and Southeast Asia, or a combination of two or more of these areas.

Admission and Aid. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois, but final selection is determined by a committee of center faculty. Applicants must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable, it is not required for admission. Those entering without any prior training or experience, however, may be required to take without credit toward the degree such work as his adviser may deem necessary to make up any deficiencies.

University and National Defense Education Act (NDEA) Title VI Graduate Fellowships and teaching assistantships are available on a competitive basis.

Master of Arts. A candidate must complete nine units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to his regional concentration by passing an appropriate language examination, pass a written examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers.

Minors in Asian Studies. A candidate for a master's degree who elects Asian studies as a minor must earn at least two units of graduate credit in approved courses in at least two departments outside his major department.

A doctoral candidate who elects Asian studies as a minor must earn at least

four units of graduate credit in approved courses in at least two departments outside his major department. Also, prior to the completion of his course requirements for the degree, the doctoral candidate must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Head of the Department: Icko Iben, Jr.
Correspondence and Information: Head, Department of Astronomy, University of Illinois, 103 Observatory, Urbana, Illinois 61801

FACULTY

Professors: I. Iben, Jr., G. C. McVittie, G. W. Swenson, Jr., S. P. Wyatt, K. M. Yoss
Associate Professors: J. H. Cahn, J. R. Dickel, J. B. Kaler, E. C. Olson,
Assistant Professor: J. C. Webber

Graduate Programs. The Department of Astronomy offers graduate work leading to the Master of Science and Doctor of Philosophy in Astronomy (including radio astronomy).

Admission and Aid. An admission average of 4.0 is required. Applications of students with grade-point averages below 4.0 but above 3.75 are considered on an individual basis. Additional normal entrance requirements are bachelor's degree in astronomy, physics, electrical engineering, physical chemistry, or mathematics, and a one-year course in descriptive astronomy. The award of financial assistance normally requires an average substantially higher than 4.0.

Master of Science. Eight units of study in graduate courses are required. There are no thesis or foreign language requirements. The eight units of course work may be distributed in one of the following three ways: all units taken in astronomy; two units selected from approved courses in physics, two units from approved courses in mathematics, with the remaining units selected from astronomy courses; or, for a specialty in radio astronomy, two units in advanced electricity and magnetism, two units in electromagnetic waves and radiating systems and in advanced elctromagnetic engineering, one unit in radio astronomy, and the remaining units in astronomy courses.

Doctor of Philosophy. A student continuing beyond the master's degree takes eight additional units of study, and also during this time demonstrates a reading knowledge of two foreign languages selected from French, German, and Russian. He then must pass a preliminary examination. Finally he completes a doctoral thesis.

BIOPHYSICS AND BIOPHYSICAL CHEMISTRY (MOLECULAR BIOLOGY)

Biophysics is a rapidly growing field that cuts across many disciplines. An area overlapping with this and developing through interaction of chemistry and biology is that of biophysical chemistry.

Since graduate study in biophysics and biophysical chemistry involves several areas of biological and physical sciences, the Graduate College has adopted a

flexible system enabling students to enter special interdisciplinary programs in these areas, thus affording them a wide range of opportunity for study and research in borderlands between the biological and physical sciences.

For the program leading to the Doctor of Philosophy in Biophysics, see the description under Life Sciences.

Students majoring in chemistry or microbiology may elect to specialize in biological problems at the molecular level. Students in other areas of the biological and physical sciences who wish to arrange programs of study emphasizing biophysics should direct their inquiries to the head of the major department.

BUSINESS ADMINISTRATION

(Including Business and Marketing)

Head of the Department: Kenneth P. Uhl
Correspondence and Information: Department of Business Administration, University of Illinois, 350 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: N. M. Bedford, R. N. Corley, P. M. Dauten, R. V. Evans, R. Ferber, R. M. Hill, F. M. Jones, H. M. Schoenfeld, J. N. Sheth, J. L. Simon, S. Sudman, W. E. Thomas, K. P. Uhl
Associate Professors: R. L. Black, J. B. Cohen, D. M. Gardner, H. Hinomoto, B. F. Kirkpatrick, L. J. Rago, D. M. Roberts, K. M. Rowland
Assistant Professors: R. J. Arnould, B. J. Calder, D. J. Cherrington, W. F. Egloff, J. Johansson, V. P. Marathe, J. Pfeffer, W. Rom, G. Salancik, F. W. Winter, P. Wright

Graduate Programs. The Department of Business Administration offers graduate programs leading to the degrees of Master of Business Administration, Doctor of Philosophy in Business, and Doctor of Philosophy in Marketing.

Admission. The minimum requirement is an admission average of 4.0. Under exceptional circumstances the department will also consider otherwise well-qualified applicants whose average falls between 4.0 and 3.75. An additional minimum requirement for admission to the graduate programs is a score of 560 or better on the Admission Test for Graduate Study in Business (ATGSB), administered by the Educational Testing Service, Princeton, New Jersey 08540.

Students seeking admission to the Master of Business Administration program should have completed the first-year, college-level courses in statistics and calculus. Students may be admitted with a deficiency in calculus, but they will be required to remove this deficiency immediately upon entering a master's program. Also, for those students seeking admission to either the Doctor of Philosophy in Business or the Doctor of Philosophy in Marketing program, a minimum level of competence in the behavioral sciences and economics is assumed. Adequate background in the behavioral sciences includes introductory to intermediate courses in psychology, sociology, or social psychology. Adequate background in economics includes intermediate courses in micro- and macro-economics. Deficiencies in the behavioral sciences and economics may be removed following admission to a doctoral program.

Master of Business Administration. The Master of Business Administration program is designed especially to meet the educational needs of students preparing for a variety of administrative positions. The program is designed so that superior

students from many areas of undergraduate study will be able to achieve a rigorous educational background in business administration within two years. It is the purpose of the M.B.A. program to develop and apply fundamental concepts and methods in the quantitative, social, and behavioral sciences to problems in administrative decision making. The program requires a minimum of sixteen units of course work. No thesis is required. Candidates with background in functional areas of business may graduate with a minimum of twelve units of course work. Candidates are admitted in September; those with certain academic deficiencies may be admitted in June.

A proposal to offer a M.S. in Business Administration was submitted for consideration early in 1972. If approved, this program will provide a ten- to twelve-unit master's program for students with an undergraduate background in business who desire additional training in a specialized area of business. It will have a research focus and will prepare the student for further advanced study in the doctoral program or a research-oriented staff position. For current information write to the Department of Business Administration.

Doctor of Philosophy in Business. Students from a variety of such educational backgrounds as economics, engineering, mathematics, political science, psychology, and sociology, as well as business administration, are encouraged to apply to this program. Study is based on a foundation in economics, behavioral science, and quantitative analysis which may be completed after admission. Areas of concentration are defined by the student in consultation with his faculty adviser. Typical areas of major concentration are the following: management science; organizational behavior; production; international business; information systems; and specialized areas of finance and marketing. The program prepares students for academic or professional careers in which research is important.

A minimum of sixteen units of course work beyond the bachelor's degree (or eight units beyond a master's degree) and an additional eight units of thesis work must be completed. A student is expected to register for at least two units of work in each semester until he has completed his program. Summer registration is not required although it is recommended.

The program is organized in three phases, which may overlap. Phase I ends with the passing of an examination on the foundations of business. No courses are required in this phase, and many students' prior work will provide adequate preparation. The examination must be taken as soon as possible after entrance into the program and no later than the examination period immediately following the student's third semester.

Phase II includes preparation in a major and a minor field of concentration. The major must include the equivalent of at least eight units of related courses. The minor consists of the equivalent of at least 4 units of work and may be split between two of the following areas: accountancy, economics, finance, marketing, mathematics, psychology, sociology, and statistics. A written and oral preliminary examination in the student's major and minor fields of specialization will be administered by a committee of the faculty chaired by the student's thesis adviser.

Phase III is the writing of a thesis reporting the results of original research of publishable quality. A written proposal describing the thesis research should be submitted as soon as possible after starting this phase. An oral final examination emphasizing the thesis research is administered by a committee.

Doctor of Philosophy in Marketing. The department offers work leading to the degree of Doctor of Philosophy in Marketing for well-qualified students interested primarily in teaching and research careers. In addition to the general admission requirements, the candidate must have adequate undergraduate preparation in business and marketing, quantitative analysis, and the social sciences. Otherwise well-qualified students with deficiencies in some areas may be admitted,

but will be required to remove their deficiencies. Following the most direct route, qualified full-time students who have completed their undergraduate work may expect to spend three years in obtaining their Ph.D. Students who have completed their work for a master's degree will be considerd for admission to the program, and will be credited for comparable course work taken elsewhere.

Examinations are taken in two stages. First, a qualifying examination in each of the three core areas of economics, quantitative methods, and behavioral science must be taken no later than the examination period immediately following a student's third full semester in the graduate program. Successful completion of this examination is a prerequisite for additional graduate work in marketing.

At the second stage, three preliminary written examinations are required of all students. After successful completion of the preliminary written examinations, the department will appoint an unofficial preliminary thesis committee for the student, based on the student's interests and needs, and on faculty availability. The student will be required to present his accepted proposal to a marketing workshop open to all interested faculty and graduate students. A final oral examination is held after completion of the dissertation.

CERAMIC ENGINEERING

(Including Ceramics)

Head of the Department: A. L. Friedberg
Correspondence and Information: A. L. Friedberg, Head, Department of Ceramic Engineering, University of Illinois, 204 Ceramics Building, Urbana, Illinois 61801

FACULTY

Professors: A. W. Allen, C. G. Bergeron, S. D. Brown, R. L. Cook, A. L. Freidberg, J. A. Nelson, F. V. Tooley, W. S. Williams
Associate Professors: R. L. Berger, T. A. Willmore
Assistant Professors: G. H. Kenner, G. P. Wirtz

Graduate Programs. The Department of Ceramic Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Ceramics or in Ceramic Engineering. The prerequisite for graduate study in these areas is proficiency in the undergraduate courses required for the Bachelor of Science in Ceramic Engineering at the University of Illinois, or acceptable equivalents.

Graduate work in Ceramic Engineering involves a program of research and instruction related to applied science and engineering, and degree candidates are usually those who have completed an undergraduate engineering degree. Ceramics encompasses a program concerned with basic materials science, and candidates may come from such nonengineering disciplines as chemistry, physics, or geology.

Admission. Applicants must have an admission average of 3.75. Students with averages between 3.75 and 4.0 are considered on an individual basis.

Master of Science. The candidate for the Master of Science in Ceramics or Ceramic Engineering must complete a minimum of eight units of graduate work, including a thesis.

Doctor of Philosophy. Candidates for the Doctor of Philosophy in Ceramics or Ceramic Engineering are required to complete first the M.S. thesis or give equivalent evidence of research experience. They must also pass the departmental qualifying examination. There is no foreign language requirement. Minor require-

ments are satisfied by courses selected in chemistry, physics, mathematics, geology, or other engineering disciplines.

CHEMICAL PHYSICS

Head of the Department of Chemistry: H. S. Gutowsky
Head of the Department of Physics: Ralph O. Simmons
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head of the Department of Chemistry, University of Illinois, 108 Noyes Laboratory, Urbana, Illinois 61801; students with undergraduate degrees in physics should direct inquiries and applications to the Head of the Department of Physics, University of Illinois, 215 Physics Building, Urbana, Illinois 61801

Graduate Program. Fundamental research on many properties of molecular and solid state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department of the University. A program leading to the Doctor of Philosophy in Chemical Physics makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Students may make use of the facilities available in both the School of Chemical Sciences and the Department of Physics.

Admission and Aid. Applicants for admission should have undergraduate degrees in chemistry or physics, an admission average of at least 4.0, and a strong background in the major field of chemistry or physics, with more than the usual training in the other area. Those who received their degrees in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degrees in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

Doctor of Philosophy. In addition to taking a series of appropriate courses, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). Research for the dissertation is performed under the direction of staff members who are currently active in chemical physics. Many of these staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students from Physics, Chemistry, Metallurgy, Ceramic Engineering, Electrical Engineering, and other related departments, who have common interests in materials science. It promotes interdisciplinary interactions, fresh viewpoints, and a creative and stimulating environment. (See page 15.)

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School of Chemical Sciences: H. S. Gutkowsky
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois, 108 Noyes Laboratory, Urbana, Illinois 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering, and Chemistry. Study programs leading to the degrees of Master of Science and Doctor of Philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of the three departments, and yet retain the advantages of a common approach to overlapping concerns. Support for graduate training is available in the form of teaching and research assistantships, University and other fellowships, and traineeships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department, or from the Director of the School of Chemical Sciences.

BIOCHEMISTRY

Head of the Department: Lowell P. Hager
Correspondence and Information: Head, Department of Biochemistry, University of Illinois, 415 Roger Adams Laboratory, Urbana, Illinois 61801

FACULTY

Professors: J. Gorski, I. C. Gunsalus, L. P. Hager, R. F. Nystrom, G. Weber
Associate Professors: J. M. Clark, Jr., H. E. Conrad, J. M. Wood
Assistant Professors: K. M. Dus, W. O. McClure, R. I. Gumport, P. G. Schmidt, J. Robinson, R. L. Switzer, O. C. Uhlenbeck, J. G. Wetmur

Graduate Programs. The Department of Biochemistry offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees in Biochemistry.

Admission and Aid. Students are considered for admission with full standing if they hold an undergraduate degree in a physical or natural science area and have an admission average of at least 4.0. Borderline grade point averages will be considered on an individual basis. Applicants are expected to have completed a full year each of organic and physical chemistry at the undergraduate level and to have taken the equivalent of a strong minor program in the life sciences area. Students whose undergraduate training is deficient in one or more of these areas can be admitted with the provision that the deficiencies will be removed in an early phase of their graduate training. Financial aid is available to virtually all students who are accepted as degree candidates in the Ph.D. program. This aid is available in the form of National Institutes of Health Traineeships, fellowships, and teaching and research assistantships.

Master of Science. The Master of Science in Biochemistry may be completed with or without a thesis. A coursework master's degree requires a minmum of two full-time semesters and involves eight units of formal lecture and laboratory course work. A Master of Science degree with thesis usually requires a minimum of three semesters work, in which three of the eight required units may involve thesis research. There is no foreign language requirement.

Doctor of Philosophy. Qualification for the Ph.D. program in Biochemistry involves passing a research qualifying exam within the first eighteen months of residency and requires the successful completion of a series of written cumulative exams. A reading knowledge of one foreign language (French, German, or Russian) is required for the degree. A thesis based on original research must be presented to a review committee at least two weeks prior to the final examination. The final examination is limited to a defense of the thesis research topic. The Ph.D. degree program usually takes three to five years for completion.

Chemical Engineering

Head of the Department: J. W. Westwater
Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois, 113 Roger Adams Laboratory, Urbana, Illinois 61801

FACULTY

Professors: H. G. Drickamer, T. J. Hanratty, R. A. Schmitz, J. W. Westwater
Associate Professors: C. A. Eckert, J. L. Hudson, R. L. Sani
Assistant Professors: R. C. Alkire, A. A. Kozinski

Graduate Programs. The Department of Chemical Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy in Chemical Engineering. Those interested should write to the address above for application materials and a departmental brochure which gives greater detail on the programs, offerings, admission, degree requirements, and financial aid.

Admission and Aid. Candidates for advanced degrees in Chemical Engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois, and an admission average of 4.0. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with deficiencies to be removed to the extent prescribed by their adviser. Financial aid is available in the form of fellowships, teaching assistantships, and research assistantships.

Master of Science. Requirements for the Master of Science in Chemical Engineering include eight units of graduate credit and a thesis. At least five of these units must be in courses other than thesis, and they must include at least two graduate-level chemical engineering courses. There is no foreign language requirement.

Doctor of Philosophy. Requirements include twenty-four units of graduate credit, a reading knowledge of one foreign language (French, German, or Russian), satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test normally taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course and language requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: H. S. Gutkowsky
Associate Head: J. P. Hummel
Correspondence and Information: Head of the Department of Chemistry, University of Illinois, 108 Noyes Laboratory, Urbana, Illinois 61801

FACULTY

Professors: D. E. Applequist, P. Beak, T. L. Brown, D. Y. Curtin, R. S. Drago, H. G. Drickamer, W. H. Flygare, H. S. Gutowsky, G. P. Haight, Jr., J. P. Hummel, H. A. Laitinen, N. J. Leonard, H. V. Malmstadt, R. A. Marcus, J. C. Martin, K. L. Rinehart, H. R. Snyder, P. E. Yankwich
Associate Professors: R. L. Belford, R. M. Coates, J. Jonas, I. C. Paul,

W. H. Pirkle, D. H. Secrest, S. G. Smith, G. D. Stucky
Assistant Professors: E. K. Barefield, J. K. Beattie, D. Chandler, W. T. Ford, D. N. Hendrickson, J. A. Katzenellenbogen, J. R. Lombardi, J. D. McDonald, D. F. S. Natusch, P. G. Schmidt, O. C. Uhlenbeck, J. G. Wetmur, J. T. Yardley

Graduate Programs. The degrees offered in chemistry are Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. Attention is also called to a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 51) and to the programs in Biophysics (see page 93) and in Biophysical Chemistry (see page 47).

Admission and Aid. Students who have fulfilled the usual undergraduate course requirements, including at least twenty-five properly distributed semester hours in chemistry, and who have an admission average of at least 4.0, may apply for admission to the Graduate College in any of the programs offered by the Department of Chemistry. Applications of students with admission averages below 4.0 but above 3.75 are considered on an individual basis. Students who have completed graduate work in chemistry at another institution may be admitted if they have averages of 4.0 in both undergraduate and graduate work, or if they have earned a 4.25 average in at least eight units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the Teaching of Chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree. Students in any of the programs are eligible to apply for financial aid which is available in the form of fellowships or traineeships, teaching assistantships, and research assistantships.

The Teaching of Chemistry Program. Candidates for the Master of Science in the Teaching of Chemistry must earn four units of credit in chemistry, two units in education, and two units of electives in either education or physical science. The two units in education consist of courses in the history and philosophy of education and educational psychology. The courses in chemistry and the electives, which must normally give graduate credit, must be selected with the approval of the adviser. Questions concerning the Teaching of Chemistry Program can be addressed to Professor D. H. Secrest, 155 Noyes Laboratory.

Master's Progams in Chemistry. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A thesis is optional and there is no language requirement.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialties including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. Besides completing formal course work, the students are required to pass a series of written cumulative exams, demonstrate a reading knowledge of a foreign language, and submit a thesis on original research which is defended at a final oral exam.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering)

Head of the Department: N. M. Newmark
Correspondence and Information: Head, Department of Civil Engineering, University of Illinois, 1114 Civil Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: W. C. Ackermann, A. H.-S. Ang, J. E. Baerwald, E. J. Barenberg, J. W. Briscoe, A. B. Chilton, V. T. Chow, E. Danner, M. T. Davisson, D. U. Deere, R. I. Dick, D. C. Drucker, R. S. Englebrecht, R. A. Eubanks, B. B. Ewing, W. J. Hall, J. D. Haltiwanger, W. W. Hay, A. J. Hendron, Jr., M. Herrin, H. O. Ireland, H. M. Karara, C. E. Kesler, N. Khachaturian, R. W. Larimore, T. E. Larson, J. P. Murtha, N. M. Newmark, J. T. O'Connor, J. E. Pearson, R. B. Peck, J. T. Pfeffer, A. R. Robinson, M. O. Schmidt, W. C. Schnobrich, L. R. Shaffer, C. P. Siess, G. K. Sinnamon, M. A. Sozen, J. E. Stallmeyer, M. R. Thompson, T. H. Thornburn, R. W. Woodhead, R. N. Wright
Associate Professors: M. Amin, R. L. Berger, L. T. Boyer, W. L. Gamble, G. R. Gurfinkel, E. R. Holley, W. H. C. Maxwell, V. J. McDonald, J. W. Melin, R. J. Mosborg, J. J. Stukel, W. H. Walker, H. G. Wenzel, K. W. Wong, B. C. Yen
Assistant Professors: P. C. Birkemoe, E. S. Chian, E. J. Cording, B. J. Dempsey, F. V. Lawrence, H. V. Leland, L. A. Lopez, C. R. Marek, D. D. Meredith, G. Mesri, B. Mohraz, S. L. Paul, B. C. Paulsen, D. A. W. Pecknold, J. B. Radziminski, Q. Robnett, V. L. Snoeyink, W. Tang, Y. K. Wen, R. H. Wortman, J. F. Young

Graduate Programs. The Department of Civil Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Civil Engineering and in Environmental Engineering in Civil Engineering.

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the general fields of: air pollution; computer-aided design; construction management; structural analysis and design; foundations; earthquake engineering; environmental engineering in civil engineering; geodesy; highway and materials; hydraulics and hydrology; liquid-solid waste management; materials engineering; nuclear shielding; photogrammetry; soil and rock mechanics; structural mechanics; probability and stochastic processes; systems engineering; transportation; and water resources. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission and Aid. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois, provided the applicant's preparation is appropriate to advanced study in his chosen major field, and his admission average is at least 4.0. Under certain conditions, applicants with averages less than 4.0 and applicants from schools with different grading systems may be considered if their averages are equivalent to, or higher than, 3.75, and evidence is submitted indicating that the applicant's ability is not appropriately measured by the grades submitted.

Financial assistance is available to promising graduate students through fellowships, traineeships, teaching and research assistantships, tuition and fee waivers, and loans. For additional information, see the department pamphlet "Graduate Study and Research in Civil Engineering and in Environmental Engineering in Civil Engineering."

Master of Science. A master's program may be completed in one full-time aca-

demic year of study. A candidate for the master's degree must complete at least eight units of graduate work with satisfactory grades with a thesis or nine units without a thesis. A candidate for the master's degree must spend at least two semesters in residence and must earn at least half of the required units while in residence. Under certain conditions, a student holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time. There is no language requirement.

Doctor of Philosophy. The degree of Doctor of Philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. In accordance with Graduate College regulations, two of the three stages must be completed in residence. The major area of specialization encompasses courses and research which are closely related but the courses need not necessarily be offered by a single major department. Several options are available for meeting the language requirements of the department. The candidate must demonstrate his capacity for independent research by preparing an original thesis on a topic within his major field of study, and the candidate must pass both formal preliminary and final examinations.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Head of the Department: John J. Bateman
Director of Graduate Study: Mark Naoumides
Correspondence and Information: Director of Graduate Study, Department of the Classics, University of Illinois, 4072 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. J. Bateman, J. L. Heller, R. P. Oliver, M. Marcovich, M. Naoumides, W. R. Schoedel, L. Wallach
Associate Professors: J. K. Newman, R. T. Scanlan
Assistant Professors: H. L. Allen, D. F. Bright, H. M. Dunn, H. Jacobson, V. K. Robbins, D. J. Taylor

Graduate Programs. The Department of the Classics offers graduate work leading to the Master of Arts and the Doctor of Philosophy. Although the graduate program is designed to educate students in breadth and depth in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including Greek and Latin patristics, mediaeval Latin, and Neo-Latin); classical archaeology; or, in conjunction with the appropriate department, comparative literature, ancient history, and ancient philosophy. A brochure describing the current *Regulations Governing Candidates for Advanced Degrees* and special programs for prospective secondary school or junior college teachers can be obtained from the department office.

Admission and Aid. Applicants for admission to graduate study in the classics must ordinarily present at least twenty hours of college-level work in either Greek or Latin. Students intending to work toward the Ph.D. must be adequately prepared in both languages. A reading knowledge of German is essential and of French or Italian highly desirable. Previous study of history and philosophy is especially recommended. The admission average is 4.0; applicants with averages below 4.0 but above 3.75 may be considered on an individual basis. Financial aid is ordinarily available in the form of fellowships, research or teaching assistantships, and waivers of tuition and fees.

Master of Arts. The Master of Arts may be taken in the Classics, Greek, Latin, or in the Teaching of Latin. Candidates for this degree must complete eight units of course work of which at least four must be in the major subject (Greek or Latin); the other four units may be in courses taken in classics or in acceptable subjects in other departments. See page 27 for special requirements in the fifth-year teaching programs.

Doctor of Philosophy. Students may be admitted to the program leading to the Ph.D. upon the completion of a Master of Arts in the Classics or the equivalent. The Doctor of Philosophy is given only in classical philology which requires advanced course work in both Greek and Latin beyond the master's level.

COMMUNICATIONS

Dean of the College of Communications: Theodore Peterson
Chairman of the Graduate Committee in Communications: James W. Carey
Correspondence and Information: Chairman, Graduate Committee in Communications, University of Illinois, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: A. M. Barran, J. W. Carey, J. B. Casagrande, S. W. Dunn, M. E. Fishbein, J. W. Jensen, H. Maclay, R. Merritt, N. Wedding, H. L. Mueller, C. E. Osgood, T. Peterson, R. J. Simon
Associate Professors: W. K. Archer, T. Guback, J. H. Schacht, N. Wiggins
Assistant Professors: W. F. Brewer, E. Douglas, D. P. Mullally, K. B. Rotzoll

Graduate Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communicatons and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinquistics. The program applies the methods and disciplines of the social sciences, supported by the humanities, fine and applied arts, and natural sciences, to the basic problems of human communications. It is intended for students who plan careers in teaching such communication subjects as journalism, radio-television, and psycholinguistics; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communicaton effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Admission and Aid. Students are considered for admission who will hold by the time of their entry into the program a bachelor's *or* master's degree with an admission average of 4.0. A broad background in the social sciences or humanities is expected. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Doctor of Philosophy. Students working toward a Ph.D. normally require from three to five years to complete their work. A full-time student entering the program directly upon receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a dissertation. Full-time students entering with a master's degree should expect to

tion. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the departments of Journalism, Radio and Television, or Advertising, or in one of the several departments in the social sciences. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the dissertation. There is no language requirement.

COMPARATIVE LITERATURE

Director of the Graduate Program: Herbert Knust
Correspondence and Information: Director of Graduate Studies, Department of Comparative Literature, University of Illinois, 2070 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: A. O. Aldridge, F. Jost, R. Montano
Associate Professor: H. Knust
Assistant Professor: B. Smalley

Graduate Programs. The program leading to the degrees of Master of Arts and Doctor of Philosophy is designed to make possible a systematic study of subjects and problems common to several literatures. Its purpose is to enable students who have greater than average linguistic competence and preparation to explore the interrelations of several literatures; the main currents, periods, and movements in literary history; and the theory of literature and criticism. The program is supervised by a committee made up of the heads and chairmen of the departments of modern languages and literatures and classics. The student's program of study is supervised by an adviser from the Program in Comparative Literature.

Admission. A student entering the program should have an undergraduate major in English, classics, or foreign languages with an admission average of at least 4.0. Majors in history and philosophy may also be accepted with the special consent of the adviser.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages as well as in English. Some knowledge of Latin (or Greek) is highly recommended; Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or neo-classicism. Competency in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the Program in Comparative Literature with the assistance of an expert in the language concerned. This choice is intended to provide for exotic languages which may not be taught in regular departments.

The candidate must also acquire eight units of credit including a course in theory of literature and two other seminars in comparative literature taught by members of the comparative literature faculty. The other five units must be taken in two or three national literatures in a distribution approved by the adviser; at least five of the eight units must be taken in courses at the 400 level. The candidate must also pass a written examination, based on a reading list, which is designed to test his knowledge of literary history as well as his ability to interpret a literary or critical text. A thesis is optional.

Doctor of Philosophy. A candidate for the Doctor of Philosophy must fulfill the

general requirements of the Graduate College including those specified above for the master's degree. He must demonstrate a competency in at least three foreign languages as well as in English. These three languages must coincide with those vital to the student's dissertation and his area of specialization. The candidate must choose at least four units of work from comparative literature seminars taught by members of the comparative literature faculty. Four additional units of work at the 400 level must be taken in courses regularly offered by the literature departments; among these, courses crosslisted with Comparative Literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. He must also select a period of major interest, and be responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be medieval, Renaissance, neo-classical and Enlightenment, or modern (nineteenth and twentieth centuries). He must pass a preliminary examination (a four-part written examination based on his individual program, plus an oral examination), and present a dissertation embracing several national literatures.

COMPUTER SCIENCE

Head of the Department: James N. Snyder
Chairman of the Committee on Fellowships, Assistantships, and Admissions: J. E. Robertson
Correspondence and Information: J. N. Snyder, Head of the Department of Computer Science, University of Illinois, 252 Digital Computer Laboratory, Urbana, Illinois 61801

FACULTY

Professors: C. W. Gear, D. B. Gillies, S. Muroga, T. A. Murrell, W. J. Poppelbaum, J. E. Robertson, D. L. Slotnick, J. N. Snyder
Associate Professors: K. W. Dickman, M. Faiman, H. G. Friedman, Jr., D. Kuck, J. Nievergelt, S. R. Ray
Assistant Professors: E. K. Bowdon, D. F. Cudia, W. J. Kubitz, R. G. Montanelli, J. R. Phillips, E. M. Reingold, P. Saylor, J. E. Vander Mey, D. S. Watanabe, T. Wilcox

Graduate Programs. The Department of Computer Science offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. There is opportunity for specialization in circuit design; computer applications in physical sciences; computer organization; digital computer arithmetic; information retrieval; languages; numerical analysis; pattern recognition; software systems; and switching and automata theory.

Admission and Aid. The admission average is 4.0. Applicants with an average below 4.0 but above 3.75 are considered as space is available. Course prerequisites are twenty semester hours of electrical engineering, mathematics, or physics, including courses in three of these four areas: computer organization and programming, numerical analysis, computer hardware, or logical design.

A student with deficiencies may still be admitted for graduate work, but will be expected to remove these deficiencies in the first year. Because of the interdisciplinary nature of computer science, the department will consider applications from students with backgrounds other than those listed above.

Master of Science. The student must complete eight units of satisfactory course work, with at least four of these from a list of computer science courses subject

to the approval of his adviser. A grade-point average of 3.75 must be maintained. Three of the eight units must be in 400-level computer science courses. A qualifying examination as described below must also be passed.

Doctor of Philosophy. The student must pass the qualifying examination described below. This examination is identical to that demanded for the M.S., but substantially better performance is required.

A reading knowledge of one foreign language must be demonstrated. Students may satisfy reading proficiency by either taking a direct examination administered by the language department, receiving an acceptable score on the Educational Testing Service test in the language, obtaining grades of A or B in the language reading course for graduate students, submitting evidence of having passed a two-year undergraduate sequence in the language, or submitting evidence of having passed a four-year high school sequence in the language. Any language for which appropriate courses or examinations exist at this University will be acceptable. A student whose native language is not English will be regarded as having satisfied the foreign language requirement upon passing the standard English language requirement which is necessary for admission to the Graduate College.

Qualifying Exam. A qualifying exam is given each semester. A graduate student must take this after completing five graduate units toward an M.S. degree, or in his second semester if he enters with a master's degree. The exam covers four areas: programming and languages, numerical analysis, logical design, and hardware. The master's candidate must pass three areas; the Ph.D. candidate must pass all four and achieve a high pass in one area. A student may retake the exam once in those areas which he fails.

DAIRY SCIENCE

Head of the Department: K. E. Harshbarger
Correspondence and Information: Department of Dairy Science, University of Illinois, 315 Animal Sciences Laboratory, Urbana, Illinois 61801

FACULTY

Professors: M. P. Bryant, C. L. Davis, K. E. Harshbarger, R. L. Hays, K. A. Kendall, B. L. Larson, J. R. Lodge, M. J. Wolin
Associate Professors: J. H. Byers, C. N. Graves, S. L. Spahr
Assistant Professors: D. E. Bauman, M. Grossman, J. L. Robinson

Graduate Programs. The Department of Dairy Science offers a program of graduate study leading to the Master of Science and Doctor of Philosophy. This program offers advanced work in several fields of specialization in dairy science including biochemistry; genetics; management; microbiology; nutrition; and physiology of lactation and reproduction. Each graduate student must select, in consultation with the head of the department, a faculty adviser and one of the fields of specialization.

Admission and Aid. For admission to full standing, an applicant's admission average must be at least 3.75. In addition, the student must demonstrate reasonable proficiency in physical and biological sciences at the undergraduate level and interest in agricultural sciences.

A limited number of fellowships and several graduate assistantships are available on a competitive basis. Graduate assistantships offer students an opportunity

to obtain teaching and/or research experience. Appointments are made for a twelve-month period, including one month of vacation.

Master of Science. A candidate for the Master of Science must complete a minimum of eight units of course work, including one-half unit of seminar and two units of thesis research. A comprehensive examination concerning the thesis and the general field of dairy science is required.

Doctor of Philosophy. A candidate for the Doctor of Philosophy must complete the M.S. degree, seven units of advanced courses, one unit of seminar, and eight units of thesis research. The advanced course requirements depend upon the area of study in which the student specializes and upon his career objectives. Information concerning such requirements may be obtained from the departmental office. The doctoral program includes a preliminary examination, a dissertation covering the thesis research, and a final examination.

DANCE

Head of the Department: Oliver J. Kostock
Director of the Graduate Program: Margaret Erlanger
Correspondence and Information: Department of Dance, University of Illinois, 4-305 Krannert Center for the Performing Arts, Urbana, Illinois 61801

FACULTY

Professor: M. Erlanger
Associate Professors: B. Blossom, O. J. Kostock, W. W. Ward, Jr.

Graduate Program. The Department of Dance offers a program of graduate study leading to the Master of Arts. This program offers advanced work in choreography; techniques; production; history; philosophy; and pedagogy, with emphasis on the related fields of art, music, and theatre.

Admission and Aid. A student who wishes to be considered for admission to graduate study in dance must have an admission average of 3.5 and have previous work in art, music, theatre, and at least eight semester hours in dance. Applicants lacking undergraduate credits in dance may substitute certified experience which is determined to be the equivalent of eight semester hours.

Satisfaction of the general requirements for admission to the Graduate College and to this program does not in itself necessarily qualify the student as a degree candidate. The Department of Dance reserves the right to accept for advanced study only those students whose preparation in dance has been obtained in certain approved institutions. Preference is given to full-time students who will be active degree candidates. Financial aid is available to a very limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. A candidate for the Master of Arts must spend at least two semesters and a summer session in residence. Of the eight units required for the degree, a minimum of four must be in dance or, with the approval of the director of the graduate program, in dance and such related areas as art, music, and theatre. Required courses in dance will be determined on the basis of the candidate's background. Two additional units are required outside the area of dance, art, music, and theatre. The remaining two units are for the presentation of an acceptable thesis and the accompanying noncredit seminar. The thesis may be waived with the approval of the adviser, but in lieu thereof the candidate must

submit two units of course work and a presentation of acceptable dances choreographed and staged by the candidate.

Not later than midpoint in the student's program, his work is reviewed to determine his status in terms of progress, ultimate completion, and awarding of the degree. The Department of Dance may extend the residence requirement or increase the total requirements at this or any other time, if such action seems warranted.

ECONOMICS

Chairman of the Department: P. T. Hartman
Correspondence and Information: Department of Economics, University of Illinois, 330 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: V L. Bassie, R. Brandis, H. J. Brems, J. F. Due, R. Ferber, D. P. Flanders, H. Folk, M. Frankel, F. M. Gottheil, A. J. Heins, D. R. Hodgman, G. G. Judge, D. L. Kemmerer, D. W. Paden, J. B. Parrish, J. D. Phillips, R. W. Resek, P. Schran, J. L. Simon, C. M. Sprenkel, K. Taira, T. Takayama, P. J. Wells
Associate Professors: G. Beckett, R. W. Gillespie, P. T. Hartman, W. W. McMahon, J. R. Millar, F. R. Shupp, S. W. Steinkamp, J. L. Weston, H. F. Williamson, T. A. Yancey
Assistant Professors: R. J. Arnould, M. A. Ferber, R. Husby, J. Leuthold, L. Neal, R. Vandendries

Graduate Programs. The Department of Economics offers graduate work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. The candidate for an advanced degree may specialize in the following fields: economic theory; history of economic thought; monetary theory and policy; public finance and taxation; growth and development; international economics; labor economics; economic history; comparative economic systems; econometrics; urban and regional economics; industrial organization; and mathematical economics.

Admission. The applicant for admission to graduate study in economics must have an admission average of at least 4.0. Students with averages between 3.75 and 4.0 are considered on an individual basis. The department recommends that the results of the Graduate Record Examination Aptitude Test accompany the application for admission.

Master of Arts or Master of Science. The master's degree may be obtained with or without a thesis. Basic requirements for both programs include two units of theory, one unit of statistics or demonstration of proficiency, and one unit in the areas of either history of economic thought or economic history, or demonstration of proficiency. The A.M. program includes four additional units, two of which must be thesis work. The M.S. program requires twelve units of work, including, in addition to the four units of basic requirements described above, one field of specialization, two units, plus six additional units of which three units are in economics and three are electives.

Doctor of Philosophy. The following requirements must be met: three units of theory; one each of history of economic thought and economic history; one unit of statistics or demonstration of proficiency; three additional fields, two of which must be in economics; and an additional eight units of dissertation work to bring the total to twenty-four units. The student is expected to have had at

least two semesters of calculus and one of linear algebra. The candidate is required to pass a written preliminary examination in theory no later than the beginning of his fourth semester and to pass written examinations in his remaining fields the following semester prior to beginning dissertation work. He is expected to give a brief oral defense of the dissertation proposal and to pass an oral final examination covering his research. This is a three-year program of study beyond the bachelor's degree for a student having adequate background in economics and mathematics and devoting *full time* to graduate work. An additional year or more may be necessary for those holding part-time assistantships.

EDUCATION

(Including Educational Administration and Supervision, Educational Psychology, Elementary Education, Higher Education, History and Philosophy of Education, Secondary and Continuing Education, Special Education, and Vocational and Technical Education)

Dean of the College of Education: J. Myron Atkin
Coordinator of Graduate Study: Robert E. Pingry
Correspondence and Information: Coordinator of Graduate Study, College of Education, University of Illinois, 110 Education Building, Urbana, Illinois 61801

FACULTY

Professors: R. C. Anderson, J. M. Atkin, S. W. Bijou, G. M. Blair, H. S. Broudy, J. Burnett, J. R. Burnett, R. J. Colwell, C. B. Cox, D. J. Delaney, T. Denny, M. D. Durkin, J. A. Easley, R. H. Ennis, R. N. Evans, L. R. Goulet, N. E. Gronlund, J. T. Hastings, P. E. Hemp, K. B. Henderson, R. A. Henderson, D. D. Henry, B. Hicks, L. G. Humphreys, J. M. Hunt, W. P. Hurder, R. S. Jones, L. J. Jordan, C. J. Karier, M. B. Karnes, M. R. Karnes, W. V. Kaulfers, C. J. Kirk, C. G. Knapp, A. B. Knox, K. M. Lansing, H. H. Lerch, M. L. Maehr, T. Manolakes, M. E. Mather, J. E. McGill, C. J. McIntyre, W. P. McLure, F. McMurray, L. E. Metcalf, P. E. Miller, W. J. Moore, C. H. Patterson, A. J. Peshkin, L. J. Phipps, R. E. Pingry, W. R. Powell, S. P. Quigley, F. M. Raubinger, S. Rosen, H. A. Schultz, J. H. Shores, P. B. Shoresman, R. H. Simpson, J. M. Slater, R. A. Smith, B. Spodek, R. E. Stake, M. R. Sumption, M. M. Tatsuoka, K. J. Travers, L. R. Tucker, R. E. Williams

Associate Professors: L. M. Aleamoni, E. F. Anderson, R. K. Brown, F. D. Carver, J. C. Chalfant, E. L. Evertts, W. Feinberg, B. P. Fillion, J. A. Fley, O. E. Gould, A. D. Groteluesche n, W. D. Johnson, H. R. Kaczkowski, L. G. Katz, A. L. Madsen, H. A. Moses, T. U. O'Banion, A. G. Rezler, F. A. Rodgers, B. Rosenshine, T. J. Sergiovanni, M. A. Shelden, H. J. Sredl, W. M. Stallings, J. Stern, R. A. Tinkham, R. M. Tomlinson, P. C. Violas, R. W. Walker, J. L. Wardrop, C. K. West, B. A. Yates, J. S. Zaccaria, R. R. Zehrbach

Assistant Professors: R. A. Chadbourn, S. Cohen, W. R. Crawford, A. J. Diekema, K. R. Koenke, J. W. Loeb, T. J. Long, A. K. Mahaffey, M. J. Masucci, R. J. Menges, M. J. Phillips, P. S. Riegel, J. A. Salvia, J. A. Teska, H. B. Thomas, S. B. Thomas, D. L. Williams

Graduate Programs. The student who majors in education may specialize in:

Agricultural education
Comparative education
Computer-assisted instruction
Counselor education

Early childhood education
Education of exceptional children (deaf, emotionally disturbed, learning disabilities, mentally retarded)
Educational administration and supervision
Educational psychology
Educational technology
Elementary school subject specialties (mathematics, language arts, science, social sciences)
Evaluation and measurement
Higher education
History of education
Home economics education
Human development
Industrial education
Philosophy of education
Reading
Rehabilitation counseling
Secondary education (English, mathematics, modern languages, music, physical education, science, social science)
School psychology
Social foundations of education
Vocational and technical education

Many other areas of specialization within education may be developed by the student and his adviser. The department is especially well organized to permit interdisciplinary studies.

Admission. Admission to graduate and professional work requires an admission average of at least 3.5 and preparation appropriate to advanced study in the chosen major. Some departments require a higher average than 3.5. Applicants who hold bachelor's degrees in fields other than teacher education are considered on an individual basis. A master's degree is required of all those who are admitted to the Advanced Certificate and doctoral study programs. Because of restrictions on enrollments all qualified applicants cannot be admitted.

Master of Arts and Master of Science. These degrees are research degrees requiring a thesis and at least one year in residence.

Master of Education. This is a professional degree designed for those engaged in educational work demanding broad, fundamental, and practical preparation. Previous work in education is required for admission. No thesis is required. Up to four units of work taken in extramural courses can be counted toward this degree. The residence requirements may be completed by taking two units each summer for two summers. Three units at the 400 level are required, with some exceptions possible.

The Advanced Certificate in Education. A master's degree in an appropriate field is required for admission to the Advanced Certificate program. Since this degree is a professional degree, two years of successful professional experience in education are required for admission. Up to four units of work may be taken in extramural courses. Four units in residence are required. Four units must be at the 400 level. A minimum of eight units are required for the degree. No thesis is required for this degree.

Doctor of Education. Programs leading to the Doctor of Education are designed to provide advanced professional training and develop further ability in the scholarly study of professional problems. Sixteen units of course work beyond the master's degree are required, and extramural credit may not be counted in this sixteen-unit requirement. A thesis is required in addition to the sixteen units of course work. Minimum residence requirements are two consecutive semesters of at least three units each, or one semester of at least three units, and the summer session immediately preceding or following, at least one and one-half units, plus an additional summer session of at least one and one-half units.

Doctor of Philosophy. This program is planned by the student with his adviser to develop the student's ability to do research in a specialized field of education. To become a candidate, the applicant must hold a master's degree with a major in education or some appropriate related subject. An applicant who has

not written a master's thesis is required to prepare and submit a paper equivalent to a master's thesis.

A student is required to demonstrate competence in one of several research technique options. The general requirements of the Graduate College (pp.) for the Ph.D. degree must be met.

Professional Work Requirement. Each doctoral candidate in the College of Education should complete an approved supervised professional work experience that consists of at least one-half time work for a semester as a part of his graduate program in education. This requirement is to be completed during the period between admission and completion of degree requirements.

ELECTRICAL ENGINEERING

Head of the Department: E. C. Jordan
Correspondence and Information: Department of Electrical Engineering, University of Illinois, 155 Electrical Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: H. W. Ades, F. T. Adler, G. E. Anner, A. D. Bailey, J. Bardeen, D. L. Bitzer, S. A. Bowhill, R. M. Brown, R. T. Chien, P. D. Coleman, J. B. Cruz, G. A. Deschamps, F. Dunn, J. D. Dyson, W. L. Emery, E. W. Ernst, G. H. Fett, O. L. Gaddy, L. Goldstein, P. Handler, D. F. Hang, M. S. Helm, C. D. Hendricks, F. E. Hohn, N. Holonyak, Jr., D. F. Holshouser, E. C. Jordan, P. Kokotovic, B. C. Kuo, Y. T. Lo, P. E. Mast, W. Mayeda, P. E. Mayes, M. S. McVay, G. Metze, R. Mittra, D. E. Muller, S. Muroga, T. A. Murrell, G. R. Peirce, W. R. Perkins, D. Pines, W. J. Poppelbaum, F. P. Preparata, J. E. Robertson, S. N. Roscoe, C. T. Sah, C. F. Sechrist, Jr., G. W. Swenson, Jr., J. T. Verdeyen, H. M. Von Foerster, N. Wax, H. D. Webb, L. Wozniak, K. C. Yeh
Associate Professors: D. P. Akitt, W. G. Albright, R. B. Ash, M. L. Babcock, J. W. Beauchamp, R. W. Burtness, J. H. Cahn, B. E. Cherrington, D. H. Cooper, M. H. Crothers, J. M. Crowley, P. R. Egbert, F. J. Fry, A. H. Haddad, P. W. Klock, S. W. Lee, C. H. Liu, E. A. Mechtly, H. Merkelo, N. Narayana Rao, J. P. Neal, S. R. Ray, H. G. Slottow, B. G. Streetman, T. N. Trick, R. J. Turnbull
Assistant Professors: C. L. Chen, A. W. Dipert, M. A. Geller, P. L. Ransom, L. D. Yau

Graduate Programs. Graduate study in electrical engineering, leading to the degrees of Master of Science and Doctor of Philosophy, is offered in four general areas: circuits and systems, which includes network synthesis, nonlinear circuits, control systems, and optimization; computers and information systems, which includes computers, switching theory, information theory, communication theory, information retrieval, artificial intelligence, and cybernetics; electromagnetic fields, which includes antennas, propagation, aeronomy, radio direction location, and holography; physical and quantum electronics, which includes solid state theory and devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles. In addition, the department cosponsors interdisciplinary areas of specialization in bioengineering, nuclear reactor kinetics, radio astronomy, quantitative neuroanatomy, ultrasonics, and electronic music.

Admission and Aid. Graduates of electrical engineering curricula substantially equivalent to that of the University of Illinois are eligible for admission. Graduates of curricula in the physical sciences and mathematics may also be admitted to

advanced study if they have the necessary background to profit from graduate work in electrical engineering.

To be admitted, an applicant must have an admission average of 4.0. Financial aid is available to a limited number of qualified students in the form of University, government, and industrial fellowships, as well as teaching and research assistantships and tuition and fee waivers.

Master of Science. A minimum of eight units must be completed for the master's degree, including a thesis. At least four units must be at the 400 level, including specific courses in two of the four basic areas. Courses which are required in the undergraduate curriculum at Illinois cannot be applied to the credit requirements for an advanced degree.

Doctor of Philosophy. All students desiring to enter the doctoral program must take the electrical engineering qualifying examination. Students who earn the master's degree at the University of Illinois take the examination during the term they earn their eighth unit of graduate credit. Students who enter with the master's degree take the examination during the first term here. Admission to the doctoral program is based upon the quality of the course work, the qualifying examination, and an assessment of the ability of the candidate to do independent research work.

Eight units of course credit beyond the master's degree (or the equivalent), successful completion of the preliminary examination, eight units of thesis research, and a satisfactory thesis are minimum requirements for the degree of Doctor of Philosophy. In his course program the student must offer a major and either one or two minors. A single minor requires four units in one field outside the major field, at least one of which must be at the 400 level. If two minors are chosen, each must consist of at least two units. Advanced courses in mathematics, physics, physiology, chemistry, nuclear engineering, and other branches of engineering are recommended minors.

Extramural Study. The department offers extramural graduate courses administered by the Division of University Extension leading to the Certificate in Engineering granted by the Extension Division. For information about this certificate program, write to the Divison of University Extension, 112 Illini Hall, Champaign, Illinois 61820.

ENGLISH

Head of the Department: George Hendrick
Director of Graduate Studies: Edward H. Davidson
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois, 102b English Building, Urbana, Illinois 61801

FACULTY

Professors: A. L. Altenbernd, R. Barksdale, L. E. Berry, E. J. Brandabur, J. J. Campbell, D. Curley, E. H. Davidson, J. Friedman, G. Hendrick, A. G. Holaday, D. V. Kramer, L. Lieberman, A. C. Purves, R. W. Rogers, C. Sanders, C. H. Shattuck, D. A. Smalley, J. Stillinger, B. F. Wilkie, H. W. Wilson

Associate Professors: N. Baym, H. C. Cole, J. A. Dussinger, J. P. Frayne, R. L. Fumento, F. E. Hodgins, J. R. Hurt, U. M. Kaufmann, K. Kinnamon, H. Marder, F. B. Moake, Y. Noble, R. L. Schneider, G. Scouffas, G. B. Stillwell, J. C. Stubbs, A. M. Tibbetts, J. B. Trahern

Assistant Professors: S. B. Bennett, T. Cable, J. Dundas, J. L. Hinley, A. Kaufman, W. D. Kay, D. Majdiak, R. D. Rhodes, M. Shapiro, J. F. Stottlar, J. Szirotny, L. Waldoff, E. S. Watts, D. E. Whisnant, G. G. Wright

Graduate Programs. The Department of English offers a full course of study leading to the Master of Arts and Doctor of Philosophy degrees. The Ph.D. program is, in general, designed to educate and train teacher-scholars who will take up positions in colleges and universities throughout the country. The Master of Arts program may be either a first step towards this professional degree or a final educational state for qualified students who wish to pursue their knowledge of English and American language and literature, for whatever reasons, beyond the undergraduate level. Two special programs for teachers, the M.A.T. and T.T.T. programs, are also offered. There is no creative writing program.

Admission and Aid. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least twenty semester hours of undergraduate college work in English and American literature, excluding required college work in rhetoric or composition. Except in extraordinary circumstances, he must have an admission average of at least 4.0. Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been well above this minimum. The committee on admissions tends to select those applicants showing a solid undergraduate array of courses, a mastery of a foreign language, and real promise of earning degrees within a reasonable time. Preference must be given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. A candidate for the A.M. in English must spend at least two semesters or the equivalent in residence. He elects at least eight units of course work distributed among the chronological areas of English and American literature. He must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work as determined by the appropriate Educational Testing Service examination. A full-time student can complete this program in an academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's must apply formally and is considered in competition with applicants who are taking the master's elsewhere. Accepted into the program, he takes eight further units of course work, in consultation with a two-member advising committee which guides his work at this stage. There are no formal requirements for further foreign language work, philology-linguistics, or outside minors. There are three formal examinations: the proficiency, general, and special examinations, which are taken at various stages of the student's progress. The first of these examinations tests the student's general critical ability, the second his general literary knowledge, and the third his competence in the field of study which he has chosen as his area of concentration. Having passed these examinations, the student goes on to write a dissertation. A full-time student may complete this program in three years beyond the master's degree.

M.A.T. and T.T.T. Programs. At the present time the department offers two special degrees: Master of Arts in the Teaching of English, and a special doctoral program designed to prepare candidates to serve as teachers of teachers or for English supervisory positions. Those interested should write for information to the Adviser of Teacher Education Programs, Department of English, 109 English Building, Urbana, Illinois 61801.

ENGLISH AS A SECOND LANGUAGE

Director of the Division: Katharine Aston
Correspondence and Information: Director, Division of English as a Second Language, University of Illinois, 3070c Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: K. Aston, Y. Kachru
Assistant Professors: L. Bouton, T. Buckingham, J. R. Cowan, W. Dickerson, E. Enata, W. Ewing, M. Hussey, M. Keen, S. Taylor

Graduate Program. The Division of English as a Second Language offers a Master of Arts in the Teaching of English as a Second Language. The curriculum leading to the degree is interdisciplinary, including courses in education and two substantive areas: English and linguistics. Electives in relevant disciplines are determined by the special needs of the students. In addition to the basic course of study on the Urbana-Champaign campus, there are curriculum options with integrated overseas internships extending over one to two years of teaching and research in the field. The curriculum was originally established to train teachers of English as a second (foreign) language. Recently this training has been extended to the teaching of English as a second dialect. Through its extensive scope and the diversity of curriculum options, the master's program supplies personnel to both domestic and foreign projects.

Students who wish to earn the degree of Doctor of Philosophy with a specialization in the teaching of English as a second or foreign language or as a second dialect must complete their study for the advanced degree in a relevant department.

Admission and Aid. Applicants for admission must present appropriate academic preparation in one of the core areas, in secondary education, in the teaching of English, or in elementary education. Applicants with majors in related areas, such as a foreign language, speech, or one of the social studies, are considered on an individual basis. Native speakers of English must have studied at least one foreign language for four university semesters or the equivalent or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English.

For a limited number of students studying on campus, teaching assistantships including tuition and fee waivers are available. All students who are out in the field in the overseas options receive monthly stipends; transportation costs to and from the overseas assignment are also covered if the assignment is completed.

Curriculum Options for the Master of Arts in the Teaching of English as a Second Language. (1) Basic domestic option. Candidates for the master's degree must earn a total of eight units, at least five of which are in the core areas. In addition, selected courses in education must be completed. Participation in at least one of the various internships or other teaching projects sponsored by the division is expected. The candidates for the degree must pass a final comprehensive examination in the core areas and must deposit with the division one term paper or an essay or original project related to the teaching and/or learning of English as a second or foreign language or as a second dialect. (2) Overseas options with an integrated internship in the teaching of English as a second or foreign language.

The general requirements for the completion of the degree through the domestic option described above apply also to these overseas options. However,

these options include an overseas internship integrated with academic study under the direction of the University of Illinois staff for a minimum of two units of graduate credit per year.

ENVIRONMENTAL STUDIES PROGRAM

Director: B. B. Ewing
Correspondence and Information: Environmental Studies Program, University of Illinois, 2535 Hydrosystems Laboratory, Urbana, Illinois 61801

Graduate Programs. The Environmental Studies Program provides coordination and support for the development of interdisciplinary and multidisciplinary programs of research, teaching, and public service in the general area of environmental studies. The program was established to provide these services pending approval of an Institute of Environmental Studies. A major research project developed with sponsorship of the Environmental Studies Program is the study of lead and other heavy metals in the environment. The study, backed by a grant from the National Science Foundation, will involve about thirty graduate students from various fields. Lead was selected as the prime pollutant for study because it is widely distributed as a result of automotive fuel consumption, is relatively immutable, and is reasonably simple to detect and measure. Research will involve lead in various aspects of the ecosystem: air, water, soil, plants, and animals. While emphasis is on lead, techniques will be applicable also to cadmium, copper, arsenic and mercury.

EXTENSION EDUCATION

Graduate Adviser and Professor: Gertrude E. Kaiser
Correspondence and Information: Extension Education, University of Illinois, 212 Mumford Hall, Urbana, Illinois 61801

Graduate Program. The Master of Extension Education is a professional program providing advanced study in agriculture and home economics, including further study in the social sciences.

Admission. Applicants are expected to hold a bachelor's degree in agriculture, home economics, or a closely related field and have an admission average of at least 3.5.

Degree Requirements. The program consists of a minimum of eight units with a thesis or nine units without a thesis. Three units must be in graduate-level courses with one unit in the major field. A major, consisting of four units, may be taken in agriculture, home economics, or the social sciences. Students majoring in agriculture or home economics select four additional units from the social sciences; those majoring in the social sciences select four additional units from agriculture or home economics. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. Students majoring in home economics must take work in three of the four major divisions of that department, unless they demonstrate proficiency in one or more of the areas by examination. At least four units must be earned in residence on the Urbana-Champaign campus. Total extramural credit cannot exceed three units.

FINANCE

Acting Head of the Department: James W. Leonard
Correspondence and Information: Department of Finance, University of Illinois, 340 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: C. T. Arlt, W. R. Bryan, R. W. Mayer, R. I. Mehr, R. C. Osborn, P. M. Van Arsdell (emeritus)
Associate Professors: T. E Cammack, I. Cochrun, J. R. Cooper, S. W. Forbes, J. W. Leonard, C. M. Linke
Assistant Professors: K. L. Guntermann, R. T. LeClair, D. L. Stevens

Graduate Programs. The Department of Finance offers graduate work leading to the Master of Science and Doctor of Philosophy. The following fields are available for specialization: money, credit, and banking; corporation finance; investment; insurance; and urban economics and real estate.

Admission. The required admission average is 4.0, although applications of students with averages below 4.0 but above 3.75 may be considered on an individual basis. The applicant is expected to have had at least twenty-seven hours of undergraduate work in social science, fifteen hours of which must have been in economics, including a course in principles of economics and other courses for which the course in principles is a prerequisite; credit in the courses in mathematics and statistics required for the bachelor's degree from the College of Commerce and Business Administration at the University of Illinois, or their equivalent, and sufficient background in the finance area and the related fields of accountancy and business administration to support, in the judgment of the graduate adviser, the candidate's educational objective.

A candidate who elects finance as a minor for either the master's degree or the doctorate must have had at least twelve hours of undergraduate work in social science, eight hours of which must have been in economics, including a course in principles of economics and other courses for which the course in principles is a prerequisite, and sufficient background in the finance area and in the related fields of accountancy and business administration to support, in the judgment of the graduate adviser, the candidate's educational objective.

Master of Science. A candidate for the master's must spend at least two semesters in residence. The credit requirement for this degree is eight units. Two units of economic theory are required. The department has an optional thesis policy for the master's degree.

Doctor of Philosophy. The doctoral candidate must obtain credit in the second course in calculus and a course in economic statistics at the graduate level. Graduate study in accountancy or statistics or both is advised strongly for such candidates. The first stage must include two units of economic theory, four units of finance, and two additional units in finance or related fields. Two of the finance units should be in thesis research. The second stage includes eight units which provide a concentration in finance, understanding of one or more fields in economics in addition to economic theory, and proficiency in any other minor field offered. After passing the preliminary examination, the candidate engages in independent research and seminars, eight units, devoted to the dissertation.

FOOD SCIENCE

Head of the Department: Arthur J. Siedler
Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois, 567 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: H. H. Draper, J. H. Hetrick, F. A. Kummerow, A. I. Nelson, T. Nishida, Z. J. Ordal, A. J. Siedler, M. P. Steinberg, J. Tobias, S. L. Tuckey, R. M. Whitney, L. D. Witter
Associate Professors: B. E. Haskell, P. V. Johnston, E. G. Perkins, L. S. Wei, H. K. Wilson
Assistant Professor: C. Argoudelis

Graduate Programs. The Department of Food Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: chemistry; engineering; microbiology; nutrition; and processing.

Admission. A student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Students whose background is deficient in the various areas of study embraced by food science will be expected to remove these deficiencies. For this purpose, graduate credit courses are available. The admission average is 3.75, but applications from students with an average of 3.5 to 3.75 may be considered on an individual basis.

Master of Science. To obtain a master's degree, a student must have two and three-fourths units in food science. The remainder of the eight units of credit required consists of graduate courses selected from inside or outside the department which are appropriate for the training and development of the student in his field of specialization. A thesis may be required at the option of the candidate and his adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the Doctor of Philosophy must have additional credit in seminar (one-fourth unit) and thesis research (eight units). The rest of the sixteen units required for the degree will consist of graduate courses selected from inside or outside the department which are appropriate for the training of the student in his field of specialization. In addition, the candidate must demonstrate proficiency in one foreign language, as approved by his adviser, in which adequate scientific literature exists and which is neither his native tongue nor English. Also he must complete a special option approved by his adviser which may be counted as part of the sixteen required units of credit. Upon the completion of all formal courses, language and special option requirements, or during the last semester of the course work, the student is required to take a series of written preliminary examinations. The final eight units after passage of the preliminary examinations are spent in research. Upon the submission of the dissertation, the candidate is admitted to the final oral examination before a faculty committee. Students specializing in nutrition may elect to receive their degree in Nutritional Sciences by satisfying the specific requirements of that program. (See page 104.)

FORESTRY

Head of the Department: W. R. Boggess
Correspondence and Information: Department of Forestry, University of Illinois, 219 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: W. R. Boggess, A. R. Gilmore, I. I. Holland, C. S. Walters
Associate Professors: J. J. Jokela, R. G. Rennels
Assistant Professors: F. A. Bazzaz, D. E. Koeppe

Graduate Program. The Department of Forestry offers graduate work leading to the Master of Science degree. The Doctor of Philosophy degree is not granted by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint appointment in another department, or is on the staff of an interdisciplinary doctoral program. Such areas of study include economics, environmental biology, genetics, plant physiology, and soils.

Admission and Aid. The prerequisite for graduate study is a bachelor's degree in forestry or a closely related field. Except in extraordinary cases, applicant must have an admission average of 3.75. A limited number of half-time assistantships is available.

Master of Science. To qualify for the master's, a student must earn eight or more units of graduate credit with at least three units in courses at the 400 level. Depending upon their backgrounds, nonforestry graduates may be required to complete certain basic forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student and to deepen his understanding in such areas as ecology, economics, entomology, genetics, mensuration, physiology, soils, statistics, or wood science. Advanced courses in special interest fields are found in various departments. In most cases a thesis is required, but it may be waived if such waiver will result in a better program for an individual student. Forestry seminar is required of all graduate students.

FRENCH

Head of the Department: B. H. Mainous
Correspondence and Information: Department of French, University of Illinois, 2090 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: E. Jaheil, F. Jost, P. Kolb, B. H. Mainous, F. W. Nachtmann, R. J. Nelson, W. M. Rivers, Y. Velan
Associate Professors: B. C. Bowen, V. E. Bowen, H. C. De Ley, S. E. Gray, F. M. Jenkins, M. K. Myers, L. B. Price
Assistant Professors: G. Laprevotte, N. Laprevotte, G. Savignon, S. Shinall, E. Talbot

Graduate Programs. The Department of French offers graduate work leading to the Master of Arts, Master of Arts in the Teaching of French, and Doctor

of Philosophy. The Master of Arts focuses primarily on literature and should interest those who wish to broaden and deepen their knowledge of French literature or who plan to go on to a doctoral program in French. The Master of Arts in the Teaching of French is designed primarily for those who are interested in teaching in secondary schools or junior colleges. The Doctor of Philosophy is designed to prepare teacher-scholars at the college or university level.

Admission and Aid. Students are normally admitted with an admission average of 4.0. Applications of students with grade-point averages below 4.0 but above 3.5 are considered on an exceptional basis. A slightly better average is expected in work in French.

Students electing French as a major subject should have had a college major in French, including practical work in the use of the language and advanced work in literature. Some knowledge of other Romance languages and literatures is desirable. Fellowships, assistantships, and tuition and fee waivers are available.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass an examination based on a general reading list. For students wanting to enter the doctoral program, this examination will serve as a qualifying examination for admission. A course in research methods and critical textual analysis is required for the degree. Proficiency in diction, phonetics, and syntax is also required.

Master of Arts in the Teaching of French. Applicants are expected to have teacher certification. Courses in French diction, phonetics, and syntax as well as courses in the history and philosophy of education and in educational psychology are required. One half of the courses are elective and are to be chosen from the areas of French literature, civilization, stylistics, linguistics, or education. Electives outside these areas are permitted.

Doctor of Philosophy. Areas of specialization within the degree program are French language and language learning; literature; and Romance linguistics. Candidates entering the doctoral program with a Master of Arts degree earned elsewhere will be expected to pass a qualifying examination in the course of their first semester of study. Candidates for specialization in language and language learning or for Romance linguistics may obtain detailed study programs from the Department of French. Candidates for specialization in literature are expected to include in their program a course in historical French grammar, which requires a reading knowledge of Latin based upon two years of high school Latin or two semesters of college Latin; at least three units of seminar courses; a course in research methods and critical textual analysis; normally, a minor consisting of two units of work outside the Department of French; and, normally, a reading knowledge of German and one language other than English and French. (If Latin is elected, the student must demonstrate proficiency adequate for research purposes.) Candidates must pass the preliminary examination and write a successful dissertation.

GENERAL ENGINEERING

Head of the Department: J. S. Dobrovolny
Graduate Supervisor: J. E. Pearson
Correspondence and Information: Graduate Supervisor, Department of General Engineering, University of Illinois, 117 Transportation Building, Urbana, Illinois 61801

FACULTY

Professors: J. S. Dobrovolny, R. A. Jewett, B. O. Larson, E. C. McClintock, Jr., J. E. Pearson
Associate Professors: H. Streeter, L. Wozniak
Assistant Professors: B. M. Hannon, G. E. Martin, D. L. Metz, D. C. O'Bryant, M. H. Pleck, R. L. Ruhl, H. J. Sprengel

Graduate Program. The Department of General Engineering in collaboration with other departments of the College of Engineering offers an area of specialization in engineering design for candidates for the Master of Science degree. This specialization is offered in the following areas: mechanical engineering, civil engineering, engineering mechanics, electrical engineering, ceramic engineering, aeronautical and astronautical engineering, industrial engineering, nuclear engineering, and computer science. This program of study is organized to prepare students to participate in the solution of wide-ranging and multidisciplinary problems through the process of engineering design. Prospective students are encouraged to write for a descriptive brochure.

GENETICS

Correspondence and Information: Director, School of Life Sciences, University of Illinois, 387 Morrill Hall, Urbana, Illinois 61801

Graduate Program. A Doctor of Philosophy program in genetics is provided through the cooperative efforts of many different departments and is administered by the University Committee on Genetics. Training is available in molecular, microbial, developmental, population, quantitative, applied plant and animal, and behavioral genetics, and in cytogenetics and evolution. Experience is provided with a choice of organisms ranging from viruses to vertebrates. Students seeking master's degrees are directed to the various departmental programs, or to the master's program in biology offered by the School of Life Sciences.

Admission. Applicants for admission should have at least a 4.0 admission average, but may, in special circumstances, be considered for admission with a 3.75 average. They should also have completed courses in quantitative and organic chemistry, trigonometry, analytic geometry, and one year of college physics. Calculus is strongly recommended.

Doctor of Philosophy. During the first two years, candidates obtain a broad background in the major disciplines of genetics (molecular and microbial, population or quantitative, and cytogenetics), and complete courses or demonstrate proficiency in biochemistry, calculus, and statistics. During the first year, a program of study is determined by the student in consultation with his adviser and the Committee on Genetics.

Thesis research may be carried out under the direction of any of the many staff members throughout the University. Candidates also usualy elect minors in one of the biology departments and in either chemistry or mathematics, but other options are available.

GEOGRAPHY

Head of the Department: John Thompson
Director of Graduate Admissions: Jerome D. Fellmann
Correspondence and Information: Director of Graduate Admissions, Department of Geography, University of Illinois, 220 Davenport Hall, Urbana, Illinois 61801

FACULTY

Professors: C. S. Alexander, J. D. Fellmann, F. W. Foster, H. G. Roepke, J. A. Russell, D. B. Shimkin, J. Thompson
Associate Professor: J. A. Jakle
Assistant Professors: D. L. Johnson, C. C. Roseman

Graduate Programs. The Department of Geography offers work leading to the Master of Arts, Master of Science, and Doctor of Philosophy. A program for prospective teachers, the Master of Science in the Teaching of Geography, is also available. At the master's level the program emphasizes broad understanding of the main systematic areas of the discipline and the acquisition of basic research competencies; programs for doctoral candidates seek depth in areas chosen for specialization and, through further study in research techniques and in allied disciplines, strive to lead students into innovative research. Detailed descriptions of the programs may be obtained from the departmental office.

Admission and Aid. Students applying for admission to the master's programs are expected to have a reasonable undergraduate background in geography and an admission average of at least 4.0. An average of at least 4.25 in the undergraduate major is required. Applicants with averages below 4.0 but above 3.75 are considered on an individual basis. Ph.D. candidates are expected to have at least a 4.5 average in previous graduate work. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the Master of Science; others receive the Master of Arts. At least four of the minimum of eight units of graduate credit required for the master's degree including research courses, must be in geography. A full-time student can complete this program in one calendar year.

Master of Science in the Teaching of Geography. Candidates for this degree must earn four units in geography, two of which are geography electives, two units in education, and two units in electives. The admission average is 3.5. Specific degree requirements may be obtained from the degree adviser, Professor F. W. Foster, 123 Davenport Hall, Urbana, Illinois 61801.

Doctor of Philosophy. Admission presupposes distinction in completing the University of Illinois master's program in geography or its equivalent. In the doctoral program, the student develops depth in areas chosen for specialization and further advances his research competence. Two units of study in allied disciplines and a minimum of six additional units in geography are required. A student must maintain a 4.5 average, complete the course requirements as determined by an individually planned program, and qualify for the departmental preliminary examination within five semesters of entering the program. There is no foreign language requirement. Normally, at some stage of the program the student is expected to show his capabilities as an instructor by serving as a teaching assistant.

GEOLOGY

(Including Earth Science)

Head of the Department: Fred A. Donath
Educational Coordinator: W. Hilton Johnson
Correspondence and Information: Educational Coordinator, Department of Geology, University of Illinois, 249 Natural History Building, Urbana, Illinois 61801

FACULTY

Professors: A. V. Carozzi, C. A. Chapman, C. W. Collinson, F. A. Donath, J. C. Frye, D. L. Graf, A. F. Hagner, W. W. Hay, D. M. Henderson, R. L. Langenheim
Associate Professors: P. A. Domenico, W. H. Johnson, G. deV. Klein, C. J. Mann, P. A. Sandberg
Assistant Professors: D. E. Anderson, T. F. Anderson, D. B. Blake, J. T. Holder, V. V. Palciauskas, D. S. Wood

Graduate Programs. The Department of Geology offers programs leading to the Master of Science and Doctor of Philosophy in Geology and the Master of Science in the Teaching of Earth Science. Programs in clay mineralogy; engineering geology and rock mechanics; environmental geology; geochemistry; geophysics; geomorphology and glacial geology; hydrogeology; marine geology; mathematical geology; mineral deposits; mineralogy and petrology; oceanography; paleontology and stratigraphy; sedimentology; sedimentary petrography; and structural geology give students a wide choice of courses and areas of specialization.

Admission and Aid. Admission requires an admission average of 4.0. Applications from students with averages below 4.0 but above 3.75 are considered on an individual basis. Geology majors with basic courses in biology, calculus, chemistry, and physics are given preference, but students with strong backgrounds in cognate fields and with little or no geology are encouraged to apply. An individual program of study will be outlined to provide the essential background to meet the needs of a student with a deficiency in geology or an allied science.

Financial aid is available in the form of fellowships, teaching assistantships, and tuition and fee waivers. In addition, part-time assistants are employed by the State Geological Survey, which is located on campus.

Master of Science. The M.S. requires a minimum of eight units of credit of which two units are normally research credit for a satisfactory master's thesis. At least three units of course work must be taken within the department, and at least three units must be completed at the 400 level. The program is normally completed in one to two years.

Master of Science in the Teaching of Earth Science. Candidates must earn four units in geology, two units in other earth science areas, and two units in education (see page 27). In addition they must fulfill the requirements to be certified to teach at the secondary school level in Illinois.

Doctor of Philosophy. The Ph.D. requires an additional eight units of course work beyond the requirements for the master's degree, and the completion of a satisfactory dissertation, including eight units of research and seminar. At least four units of course work must be taken within the department, and at least two courses totalling one and one-half units must be taken outside the department. A reading knowledge of French, German, or Russian is required. There are three formal examinations: the reading, the preliminary, and the final examinations. The first of these tests the student's general critical ability, the second is focused on the student's proposed research for the dissertation and tests the

student's preparedness for the proposed research, and the third evaluates the student's research ability as demonstrated by the completed dissertation. The program is normally completed in two to four years beyond the master's degree.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department: Harry G. Haile
Graduate Adviser: Elmer H. Antonsen
Correspondence and Information: Graduate Adviser, Department of Germanic Languages and Literatures, University of Illinois, 3072 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: E. H. Antonsen, H. G. Haile, J. W. Marchand, P. M. Mitchell, H. Stegemeier
Associate Professors: H. Knust, R. Lorbe, J. M. McGlathery, I. Rauch, R. D. Schier
Assistant Professors: M. Burkhard, C. Gray, P. Schwalbe

Graduate Programs. The Department of Germanic Languages and Literatures offers courses of study leading to the degrees of Master of Arts, Master of Arts in the Teaching of German, and Doctor of Philosophy. Fields of concentration for the Ph.D. degree are modern German literature; older German literature; and Germanic linguistics. Candidates for the Master of Arts degree may emphasize either literature or linguistics in their course of study. Detailed information concerning the requirements for advanced degrees is available through the departmental office and will be sent to prospective students along with the necessary application forms.

Admission and Aid. Applicants should have a 4.0 admission average. Applications of students with averages below 4.0 but above 3.5 are considered on an individual basis. Students should have completed a four-year course of undergraduate study in German corresponding to that of this University, be familiar with the principal works of German literature, and be able to follow lectures in the German language. Acquaintance with German history, philosophy, science, and art in their relation to the general European background is desirable. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. Candidates for the Master of Arts in German must complete eight units of graduate work, but deficiencies in undergraduate preparation may necessitate more than eight units to meet the requirements. Full-time students with good undergraduate training can normally complete the requirements in one academic year. The degree is awarded upon successful completion of a written and oral examination or upon the successful defense of a thesis.

Master of Arts in the Teaching of German. Candidates for the Master of Arts in the Teaching of German must earn four units in German, two units in the history and philosophy of education and educational psychology, and two units in electives.

Doctor of Philosophy. Students working toward the Ph.D. must complete eight units of course work beyond the master's and demonstrate proficiency in the reading of two languages other than English and German, one of which is normally French. Students in Germanic linguistics may substitute Russian for French, with the second language Scandinavian. After passing the written prelim-

inary examinations the candidate can be admitted to the oral preliminary examination. Successful completion of the oral examination admits the student to candidacy for the Ph.D. degree. He then must complete eight units of thesis research and successfully defend his thesis in an oral examination. Full-time students can complete this program in two years beyond the master's.

Study in Austria. The department sponsors a two-semester study program in Austria, based at the Pädagogische Akademie in Baden, a suburb of Vienna. In addition to serving undergraduates, the program also includes a limited number of assistantships for candidates for the Master of Arts in the Teaching of German and for other graduate students interested in giving their preparation a pedagogical component. Students may also attend lectures at the University of Vienna. Detailed information is available through the departmental office.

GOVERNMENT AND PUBLIC AFFAIRS

Director of the Institute: S. K. Gove
Correspondence and Information: Institute of Government and Public Affairs, University of Illinois, 1201 West Nevada Street, Urbana, Illinois 61801

The Institute of Government and Public Affairs is an all-University unit concerned with problems of the public sector. It offers research and consulting services to Illinois governments and officials as well as to citizen organizations and individuals. In addition, it is deeply concerned with community and urban problems and devotes considerable staff time to projects aimed at their solution. Public service, an important aspect of the institute's charge, is inextricably meshed with its research and advisory functions. Studies arising out of institute research are published for both scholarly and general audiences. Although the institute offers no formal courses, its staff members hold joint appointments and teach in their respective departments.

HEALTH AND SAFETY EDUCATION

Head of the Department: William H. Creswell, Jr.
Correspondence and Information: Department of Health and Safety Education, University of Illinois, 117 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professors: W. H. Creswell, Jr., A. E. Florio, W. J. Huffman
Associate Professor: D. B. Stone
Assistant Professors: J. D. Brown, J. Conley, L. K. Olsen, T. W. O'Rourke

Graduate Programs. The Department of Health and Safety Education offers a program of study leading to the Master of Science in Health Education. Also, Health Education is one of the three options or areas of specialization leading to the Doctor of Philosophy that is offered through a joint relationship among three departments (Health and Safety Education, Physical Education, and Recreation and Park Administration) of the College of Physical Education. The Ph.D. program is designed to prepare graduates for positions of leadership in teaching,

research, and service in colleges, universities, and health-related agencies in the United States and in other countries.

Admission and Aid. Students admitted to the M.S. program are required to have an admission average of 3.75 (applications from students whose grade-point average is below 3.75 but above 3.5 are considered on an individual basis), thirty semester hours of approved undergraduate credit in health education or closely related courses, twenty-four semester hours of approved undergraduate credit in science, sixteen semester hours of credit in education, and a course in statistics or measurement.

The Ph.D. program is one of three areas of specialization offered through the graduate department of the College of Physical Education. The admission requirements include the following: an acceptable grade-point average in undergraduate work and an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test and on the aptitude section of the Graduate Record Examination, and three letters of recommendation.

Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Science. The program of study for the Master of Science is normally completed in one year of full-time study. Eight units of work are required, including the following: four units in health education, one unit of which may be in approved courses closely related to health education; two units in education; satisfactory completion of the graduate seminar; and presentation of an acceptable thesis in health education (two units). Candidates may petition to waive the thesis but will be required to take two units in lieu of thesis credit, and, in addition, to pass a final comprehensive written examination in health education.

Doctor of Philosophy. Candidates for this degree must complete a minimum of twenty-four units of credit, including the following: a minimum of eight units in the major or related fields; one minor for a minimum of four units, or two minors for a minimum of two units each (in both cases outside the major and related fields); ability to translate accurately two foreign languages, or ability to read, write, and converse satisfactorily in one foreign language (two additional approved graduate course units may be substituted for each of the two foreign languages); a seminar in the major field; and completion of an acceptable dissertation.

HISTORY

Chairman of the Department: Winton U. Solberg
Director of Graduate Studies: Walter L. Arnstein
Correspondence and Information: Department of History, University of Illinois, 309 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: W. L. Arnstein, J. L. Bates, P. P. Bernard, R. B. Crawford, C. E. Dawn, W. D. Farnham, R. T. Fisher Jr., W. Heinrichs, K. A. Hitchins, R. W. Johannsen, J. A. Nichols, D. E. Queller, P. W. Schroeder, W. U. Solberg, C. C. Spence, R. M. Sutton
Associate Professors: J. R. Dahl, L. E. Eastman, B. D. Hill, F. C. Jaher, B. B. Kling, T. A. Krueger, J. L. Love, R. M. McColley, J. P. McKay, R. E. Mitchell, J. B. Sirich, B. P. Uroff, R. W. Waller
Assistant Professors: N. M. Belting, F. F. Foster, S. B. Kim, R. C. Jennings, D. L. Ransel, C. C. Stewart, R. C. Trexler, H. J. Wechsler

Graduate Programs. The Department of History offers graduate courses leading to the Master of Arts and the Doctor of Philosophy. Complete details of these programs may be found in the department's brochure on graduate study in history. The Master of Arts degree may be either the first stage in preparation for the degree of Doctor of Philosophy or a terminal degree. Two special programs for teacher training are available, the Master of Arts in the Social Sciences and the Master of Arts in the Teaching of Social Studies. See pages 116-117.

The following fields of specialization are offered: ancient Greece; ancient Rome; medieval Europe to 1300; Europe, 1300-1648; Europe, 1648-1815; Europe since 1815; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; early America to 1830; United States since 1815; Latin America; history of science; and history of international relations since 1871.

Admission and Aid. A student who wishes to be considered for admission to graduate work in history is required to have an admission average of 4.0. A student who has done graduate work in a recognized institution without receiving a degree may petition for credit toward an advanced degree by passing examinations in this work. Results of the Graduate Record Examination Aptitude Test and the Advanced Test in History should accompany applications for admission. Undergraduate linguistic preparation, especially in French, German, or Russian, is important. For ancient, medieval, and Renaissance history, some knowledge of Greek or Latin is essential. Spanish is important for certain fields of European, American, and Latin American history. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Arts. Candidates are expected to take at least two units in two of the fields of specialization for the Ph.D., as listed in the graduate brochure. A minimum of eight units is required and three of these units must be at least one problem course and a research seminar with grades of B or better. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement. A candidate must demonstrate ability to read one foreign language related to his fields of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the Ph.D. must take a minimum of sixteen units beyond the master's degree. Eight of these units may be thesis research credit. Two research seminars are normally required for all candidates if these were not taken here in the master's program. A course in the history of historiography and a course in the problems in the teaching of college history must also be taken. A candidate must demonstrate ability to read two foreign languages related to his fields of interest as approved by the graduate advisers. The candidate must offer at least three fields in history, to be chosen from the fields of specialization listed above, with no more than two in the same area, for his preliminary examination. Candidates interested in specializing in American culture may elect a major in American history with a first minor, three units, in American literature, and a second minor, two units, in the history of fine arts in the United States.

HOME ECONOMICS

Acting Head of the Department: Helen D. Turner
Correspondence and Information: Department of Home Economics, University of Illinois, 260 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: M. Dunlap, M. Dunsing, Q. B. Mills, R. B. Smith, L. D. Trebilcock, H. D. Turner, F. O. Van Duyne
Associate Professors: H. H. Alexander, K. A. Anspach, E. L. Brown, M. Goodyear, B. E. Haskell, W. M. Mowrer
Assistant Professors: E. I. Downey, J. L. Hafstrom, B. V. Hummel, C. B. Stack, L. D. Van den Daele

Graduate Programs. The Department of Home Economics offers work leading to the Master of Science or Master of Arts in Home Economics, Master of Science in Home Economics Education, and Doctor of Philosophy in Home Economics with majors in family and consumption economics and in foods and nutrition.

Admission. The admission average is 3.75. Applications of students with averages below 3.75 but above 3.5 are considered on an individual basis. Undergraduate course requirements for admission depend on the area of specialization selected for graduate work.

Master of Arts and Master of Science. The major for a master's degree in home economics may be in one of six curricula. Candidates must complete a minimum of eight units (nine if a thesis is not submitted) of which at least four must be in home economics. Four of the total units, including at least two in home economics, must be in 400-level courses. Programs are available in child development and family relationships; family and consumption economics; family housing and household management; foods and nutrition; general home economics; and textiles and clothing. In addition, family and consumption economics requires two units of economic theory; foods and nutrition requires biochemistry. Family housing and household management requires two units in social sciences; courses in housing may be taken in agricultural mechanization, architecture, and home economics. General home economics requires courses in three of the other five areas of specialization in home economics.

Master of Science in Home Economics Education. Candidates must earn eight units, four of them in home economics. Three of the eight units must be at the 400 level and at least one of these must be in home economics. Two units are required in foundation courses in general education and two units are required in home economics education.

Doctor of Philosophy. For a major in family and consumption economics required courses include four units of family and consumption economics, two at the 400 level; two units of economic theory (400 level); two additional units of economics and/or agricultural economics (400 level); two units of anthropology, psychology, and/or sociology, or one unit in these areas and one in family relationships; and one unit of applied statistics. Economics must be chosen as a minor field either as a sole minor or in combination with an area such as agricultural economics, anthropology, sociology, closely related areas in home economics, or an area involving international programs.

For a major in foods and nutrition, required courses include at least three units of foods and nutrition, two at the 400 level; one unit of statistical methods at the 400 level; courses in biochemistry and physical chemistry; and an advanced course in food microbiology or mammalian physiology. Additional courses in the above areas or in animal nutrition or food science are selected to satisfy major requirements. Candidates may minor in animal nutrition, biochemistry, food science, microbiology, physiology, or other appropriate areas.

HORTICULTURE

Head of the Department: C. J. Birkeland
Correspondence and Information: Department of Horticulture, University of Illinois, 124 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: C. Y. Arnold, C. J. Birkeland, J. R. Culbert, D. F. Dayton, J. B. Gartner, E. R. Jaycox, M. B. Linn, D. Powell, R. K. Simons, J. S. Titus, J. S. Vandemark, C. C. Zych
Associate Professors: D. B. Dickinson, H. J. Hopen, M. M. Meyer, A. M. Rhodes, W. E. Splittstoesser

Graduate Programs. Graduate work is offered in the Department of Horticulture leading to the Master of Science and Doctor of Philosophy. Students may specialize in any phase of horticulture, including genetics; physiology; ecology; developmental anatomy; marketing; or apiculture, which is offered jointly with the Department of Entomology. Well-equipped laboratories and extensive experimental farms are available for each area of specialization within the department. Special facilities available on campus include computer, electron microscope, and radioisotope laboratories. A well-balanced program may be achieved by taking courses in agronomy (crops, soils), botany, food science, genetics, statistics, plant pathology, chemistry, biochemistry, entomology, or agricultural economics. Students may minor in any of these fields.

Admission and Aid. Applicants must have an admission average of 4.0. Applicants with an average below 4.0 but above 3.75 are considered on an individual basis. Applicants should have adequate preparation in the fundamental sciences. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. A minimum of eight units must be earned for this degree, which can be completed by a full-time student in an academic year. A written thesis is optional.

Doctor of Philosophy. The candidate must complete eight units of courses beyond the master's degree and pass an oral preliminary examination. The candidate must also complete eight units of thesis research and submit an acceptable thesis. Competence in a foreign language may be required, depending on the area of specialization and recommendations of the student's advisory committee.

JOURNALISM

Head of the Department and Director of Graduate Study: Jay Jensen
Correspondence and Information: Department of Journalism, University of Illinois, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: J. Carey, J. Jensen, H. Maclay, T. Peterson
Associate Professors: G. Gilmore, G. Graham, T. Guback, G. Hanson, R. Hildwein, J. Schacht, N. Wiggins
Assistant Professors: R. Boston, L. Slovonsky

Graduate Program. The Department of Journalism offers graduate work leading

to the Master of Science in Journalism. The department does not offer a Ph.D. degree. For the program leading to the Doctor of Philosophy in Communications, see pages 57-58.

Admission and Aid. An admission average of 4.0 is required, but applicants with averages below 4.0 but above 3.75 may be considered in individual cases. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees. Positions outside the department calling for journalistic skills may be available to qualified applicants.

Master of Science. Requirements for the master's degree include the following: (1) A major of four units, or three units and one additional unit approved by the department. Candidates without undergraduate work in journalism or equivalent professional experience may be required to complete one unit of news editing, one unit of advanced undergraduate courses in writing, and, in exceptional cases, some combination of courses without graduate credit. (2) A minor of at least two units, normally in an area outside the College of Communications. (3) A thesis of one unit, or preparation of a topic in journalistic form for publication or broadcast, for one unit. Students also have the option of doing both. (4) A minimum of three units in courses at the 400 level, at least two of which must be in journalism. (5) A written report on the current master's reading list. (6) A minimum total of eight units with a grade-point average not lower than 3.875.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: M. Rothbaum
Correspondence and Information: Institute of Labor and Industrial Relations, University of Illinois, 504 East Armory Avenue, Champaign, Illinois 61820

FACULTY

Professors: M. Derber, H. Folk, W. Form, W. H. Franke, P. L. Garman, A. Green, C. L. Hulin, B. Karsh, M. Rothbaum, K. Taira, H. C. Triandis, M. Wagner
Associate Professors: G. B. Graen, P. T. Hartman, J. Scoville
Assistant Professors: P. Gerhart, J. Kimberly

Graduate Programs. The Institute of Labor and Industrial Relations offers a Master of Arts and a Doctor of Philosophy. Graduate instruction is offered in trade union, public employee, and management organization; in the accommodation of these organizations through the process and structure of collective bargaining; in personnel administration and employee relations; in manpower and human resources programs and policy; in the role of the government in legislating labor standards and labor relations; in the formulation of public policy; and in comparative and international industrial relations. These matters are studied in the context of social, economic, and political change and are analyzed with the help of theoretical and empirical formulations of economics, history, law, political science, psychology, and sociology.

Admission. Students seeking admission to the master's program must meet the general entrance requirements of the Graduate College. In addition, an institute faculty committee reviews the undergraduate record of every candidate and may refuse admission to a student whose record indicates inadequate preparation. A course in statistics is the only prerequisite for admission, although course work in the various social sciences is desirable preparation for the institute program.

Admission to the Ph.D. program is granted only to those students whose

undergraduate and graduate records indicate that they are likely to successfully complete the requirements for the Ph.D. Admission requirements are a master's degree or equivalent in labor and industrial relations or an allied field, a master's thesis or similar evidence of research competence, and three letters of recommendation. Prerequisites are courses in labor problems and statistics; college algebra and first-year calculus are recommended.

Master of Arts. Candidates have a choice of study programs. Program A requires eight units of graduate credit, two of which are granted for successful completion of a thesis. Program B requires ten units of course work. Common requirements in both programs include one unit of credit in research methods, one unit of credit in quantitative analysis, responsibility for a list of required readings, and a comprehensive oral examination.

Doctor of Philosophy. The candidate's course work is concentrated in two or more social science disciplines related to a selected area of specialization; in addition, five units of course work in methodology and industrial relations theory are required.

LANDSCAPE ARCHITECTURE

Head of the Department: Robert B. Riley
Coordinator of the Graduate Program: Albert J. Rutledge
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois, 205 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: W. M. Keith, R. B. Riley
Associate Professors: A. J. Rutledge, D. L. Walker, Jr.
Assistant Professors: T. G. Harkness, R. W. Zolomij

Graduate Program. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture. The program is designed to enable students to gain fresh insights and experiment with new applications pertaining to land and its use by people. A pamphlet describing specific areas of study is available upon request.

Admission. The minimum admission average is 3.75. Those with lower averages may be considered on an individual basis if they possess significant experience in professional landscape architectural work. Candidates from undergraduate design programs must accompany applications with samples of their design work.

Candidates may possess a bachelor's degree in landscape architecture or an undergraduate degree in another field. The latter are expected to complete prerequisite courses in the basic skill areas of landscape architecture before pursuing graduate level study.

Degree Requirements. A student must complete a minimum of eight units comprising five and one-half units taken within the department (including thesis) and two and one-half units of electives chosen from courses offered outside the department. Specific courses to be taken are determined in consultation with an adviser.

LATIN AMERICAN STUDIES

Director of the Center for Latin American Studies: Merlin H. Forster
Correspondence and Information: Center for Latin American Studies, University of Illinois, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: J. Allen, J. Casagrande, F. Dovring, F. Fliegel, M. Forster, D. Lathrap, L. Leal, A. Pasquariello, E. Rae, S. Schmidt, R. Scott, J. Thompson
Associate Professors: G. Behague, D. Butterworth, D. Grove, J. Love, T. Meehan, R. Preto-Rodas, N. Whitten, R. Zuidema
Assistant Professors: A. Aiex, R. Byars, P. W. Drake, M. Francescato, R. Pelczar, M. Solaun, J. van Es, R. Vandendries

Graduate Programs. Graduate minors in Latin American studies are administered by the director of the Center for Latin American Studies.

Candidates for the master's degree who elect a minor in Latin American studies must complete two units from the courses prescribed by the center. Doctoral candidates who elect a minor in this area must complete four units for a sole minor, or two units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center.

Students in technical and professional colleges and schools of the University who seek knowledge of Latin American affairs, culture, and languages are invited to consult with the director of the center, or with their advisers, in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry on technical or professional work in the Latin American area for the government, private business, publications, or religious organizations.

LAW

Dean of the College of Law: John E. Cribbet
Associate Dean: W. R. LaFave
Director of Graduate and International Legal Studies: Peter Hay
Correspondence and Information: College of Law, University of Illinois, 209 Law Building, Champaign, Illinois 61820

FACULTY

Professors: D. C. Baum, M. W. Benfield, C. H. Bowman, R. G. Cohn, J. J. Costonis, J. E. Cribbet, R. W. Findley, G. T. Frampton, S. B. Goldberg, W. D. Hawkland, P. H. Hay, H. D. Krause, W. R. LaFave, P. B. Maggs, P. H. Marshall, J. H. McCord, J. O'Connell, S. J. Plager, C. W. Quick, R. Reisner, H. Semmel, V. J. Stone, J. N. Young
Associate Professor: T. D. Morgan
Assistant Professor: N. E. Holler

Graduate Programs. The College of Law offers a program of graduate work leading to the Master of Laws, Master of Comparative Law, and Doctor of the Science of Law.

Master of Comparative Law. A student whose undergraduate study in law has been in systems based on the Anglo-American common law is eligible to apply for candidacy for the Master of Laws or Doctor of the Science of Law. A foreign lawyer whose prior law study has been in a system which is not based on the Anglo-American common law may, in exceptional cases, be admitted to candidacy for the Master of Laws or Doctor of the Science of Law, or such foreign lawyer may apply for candidacy for the Master of Comparative Law. The Master of Comparative Law program is designed to develop facility in the comparative method and to prepare a foreign lawyer to deal knowledgeably with Anglo-American problems. Admission standards, as well as residency, course, and thesis requirements, are substantially the same as for the LL.M. and J.S.D. programs.

Master of Laws and Doctor of the Science of Law. For admission, an applicant must have received a first degree in law from a law school which has graduation requirements substantially the same as the University of Illinois College of Law, and must present evidence of ability to do satisfactory work at the graduate level. Normally no student is admitted as a candidate for the Master of Laws unless he has a grade-point average of 4.0 in all law work previously undertaken. A student who is a candidate for the degree of Doctor of the Science of Law is normally required to have a grade-point average of 4.0 in all law work previously undertaken, and also to present evidence that he has the ability to do independent research; the latter requirement may be met by the submission of satisfactory legal writing done while the applicant was a candidate for the Juris Doctor (or equivalent degree), or subsequent to the receipt of that degree.

One academic year in residence is required of a candidate for an advanced degree. The programs consist of course work and research which have been approved by the committee on graduate study of the College of Law, comprising at least eight units of graduate work of which at least two for the master's degree and four for the doctor's degree must be in research. In addition to the course work and research, a thesis is required. For the master's degree, the thesis may be completed during the year in residence. For the doctor's degree, the thesis must be submitted not less than one year nor more than five years after the completion of the residence requirements, and the candidate must pass an oral examination before a committee of the faculty. The candidate for the Master of Laws must secure an average of 3.5 in his graduate law courses; the candidate for the Doctor of the Science of Law, an average of 4.0.

Financial Aid. The College of Law offers seven teaching assistantships to students whose background has been in the Anglo-American common law system and four teaching assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition and fees is available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by January 1.

LIBRARY SCIENCE

Director of the Graduate School of Library Science: H. Goldhor
Correspondence and Information: Graduate School of Library Science, University of Illinois, 329 Library, Urbana, Illinois 61801

FACULTY

Professors: G. S. Bonn, H. Goldhor, D. W. Krummel, W. C. Ladley, M. A. Lohrer, R. E. Stevens

Associate Professors: W. C. Allen, J. L. Divilbiss, K. L. Henderson, F. W. Lancaster, C. E. Thomassen
Assistant Professors: R. E. Brown, F. A. Schlipf, L. M. Wert

Graduate Programs. The purpose of the Graduate School of Library Science is to prepare men and women for careers as professional librarians in all types of libraries. Programs of study may be followed leading to the Master of Science, Certificate of Advanced Study in Librarianship, Doctor of Philosophy, and Doctor of Library Science.

Admission. In addition to the Graduate College requirements, applicants must meet the following requirements: an admission average of 3.75; one sequence (two terms) of courses at the college level in each of the three main fields of science, social science, and humanities, and a total of four such sequences in all; a major subject in any field of study (except library science) comparable to the undergraduate major at the University of Illinois (at least twenty-four semester hours); and two years of college-level study of any foreign language. This may be either two years of study of one language or one year of each of two languages.

Master of Science. At least two semesters in residence—or the equivalent—are required to earn the master's degree. Each student's program of study, adapted to his particular needs and purposes, is planned in consultation with a faculty adviser at the time of original registration and thereafter.

Certificate of Advanced Study. This program is open to those who hold a master's degree in librarianship from an accredited library school and who have a minimum of two years of acceptable professional library experience since receiving the degree. Applicants for this degree must have maintained a grade-point average of at least 4.0 in the master's program. The certificate is awarded upon the successful completion of eight units of graduate course work. Of the eight units, at least half must be in library science.

Doctor of Philosophy and Doctor of Library Science. Applicants to these programs must meet the following requirements: master's degree in library science from an accredited library school with a 4.0 grade point average, two years of acceptable full-time library work experience since receipt of the master's degree, submission of scores on the Aptitude Test of the Graduate Record Examination taken within the last five years, letters of recommendation from three people (including a library work supervisor), and an interview with two or more members of the doctoral committee of the faculty. It takes a doctoral student at least three years of full-time study to earn the degree. Preference is given to those applicants for admission who expect to stay in the program continuously until they finish. In no case may a candidate have more than seven years in which to earn a doctorate.

LIFE SCIENCES

(Including Biology, Botany, Entomology, Microbiology, Physiology and Biophysics, and Zoology)

Director of the School of Life Sciences: L. Leon Campbell
Correspondence and Information: Director, School of Life Sciences, University of Illinois, 387 Morrill Hall, Urbana, Illinois 61801

Graduate Programs. The School of Life Sciences includes the Departments of Botany, Entomology, Microbiology, Physiology and Biophysics, and Zoology. Study programs leading to the graduate degrees of Master of Science and Doctor

of Philosophy exist in each of the departments and are described in detail in the following pages. Interdepartmental study programs leading to advanced degrees in cell biology and virology, environmental biology, neurosciences, and plant physiology are administered within the school. The school also participates with other departments of the University in offering the Ph.D. program in genetics (see page 74) and with the School of Chemical Sciences in offering a program in biophysical chemistry (see page 51).

Admission and Aid. Applicants who desire to enter any of the graduate study programs are usually required to have earned an admission average of at least 4.0. In certain programs, applicants with an average between 3.5 and 4.0 are considered by a special committee.

Support for graduate training is available in the form of teaching or research assistantships, University fellowships, or trainee fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department, or for interdepartmental study programs from the Director of the School of Life Sciences.

INTERDEPARTMENTAL STUDY PROGRAM

Master of Science in the Teaching of the Biological Sciences and General Science. This degree is offered upon the completion of the fifth year in the teacher-education curriculum in biological and general science. The degree is primarily intended for but not restricted to certified teachers of biology and general science in junior high school, high school, and junior college. For admission to this program. students must have an admission average of at least 3.5.

Candidates for the Master of Science in the Teaching of the Biological Sciences and General Science must earn four units in biological sciences, two units in education (see page 27), and two units in electives. Electives may be in the biological sciences, education, or, in exceptional cases, other fields. A course in biological chemistry is strongly advised. Students who are preparing for high school teaching and who are not yet certified must fulfill state certification requirements. The adviser for candidates for this degree is Professor Joseph Larsen, 393 Morrill Hall.

Master of Science in Biology. This program is designed for individuals who do not wish to limit their training to a single area of biology. Students whose interests fall into a specific area of biology should apply directly to the relevant department or program.

Admission requires an admission average of at least 4.0. Applicants whose average is less than 4.0 but higher than 3.75 are considered on an individual basis. Those in the latter group should outline their educational objectives in a brief statement and should, in addition, submit three letters of recommendation. Although no specific undergraduate courses are required for admission to this curriculum, a year of physics, a course in organic chemistry, and a semester of calculus or statistics must be completed before a degree is granted. Preference is given to those applicants who have already completed most of these courses.

Candidates for the degree obtain a broad, basic training in biology and are examined in aspects of cellular, genetic, organismic, and population biology. Of the eight units required for the degree, at least three units must be taken in 400-level courses. A thesis is not required, but at least one unit of individual problem work must be included. A comprehensive examination is required of all candidates.

Doctor of Philosophy in Biology. The School of Life Sciences offers the doctorate in several interdepartmental areas: cell biology and virology, environmental biology, neurosciences, and plant physiology. Entrance requirements, in addition to those listed for the Master of Science, include background training in general

biology, physics, biochemistry, and calculus; deficiencies in these areas may be remedied during the first year of graduate study. Programs are designed to suit individual needs in consultation with advisers.

Students who have been accepted for one of these programs may select any faculty member in the School of Life Sciences, or an appropriate member of a cooperating department as a major adviser. Additional information may be obtained from the Director of the School of Life Sciences. Descriptions of the area programs are given below.

AREAS OF SPECIALIZATION

Cell Biology and Virology. The cell biology and virology program emphasizes molecular mechanisms and is therefore addressed to students who have acquired or wish to acquire a strong background in chemistry. Areas of research open to students in this program include cytochemistry, biochemistry of subcellular systems, cellular differentiation, intercellular regulation of meiosis and mitosis, circadian rhythms, cellular genetics, and virology.

Environmental Biology. The environmental biology program emphasizes a multidisciplinary approach to the study of the effects of environmental quality on living organisms. Areas of research specialization include animal, plant, and human ecology; physiological and population ecology; population genetics and systematic biology; limnology, ethology, zoonoses, and applied ecology.

Genetics. See page 74.

Neurosciences. The program in neurosciences is interdepartmental, and its staff includes psychologists, physiologists, biochemists, and ethologists. The program emphasizes physiological psychology, animal behavior, biochemistry, physiology of axons, synapses and higher nervous systems. Research areas include neurochemistry, ethology, cybernetics, comparative and mammalian neurophysiology, neuroanatomy, and physiological psychology.

Plant Physiology. Plant physiology is an interdepartmental area of specialization coordinated under the biology program. The program is staffed by plant physiologists from the five plant science departments: Agronomy, Botany, Forestry, Horticulture, and Plant Pathology. Thesis research can be conducted in any of these departments. Areas of research include photosynthesis, respiration, membrane transport, nitrogen, herbicide action, water relations, and environmental physiology. In addition to plant physiology, students are required to complete courses in biochemistry and physical chemistry.

Botany

Head of the Department: John B. Hanson
Associate Head: Zane B. Carothers
Correspondence and Information: Associate Head of the Department of Botany, University of Illinois, 297 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: L. M. Black, J. M. J. deWet, Govindjee, J. B. Hanson, J. R. Laughnan, J. F. Nance, D. P. Rogers, D. M. Steffensen
Associate Professors: J. S. Boyer, Z. B. Carothers, D. K. Cox, D. B. Dickinson, L. R. Hoffman, R. MacLeod, W. W. Payne, T. L. Phillips, R. W. Tuveson
Assistant Professors: C. J. Arntzen, F. A. Bazzaz, A. W. Haney, M. L. Sargent, D. S. Seigler, L. N. Vanderhoef

Graduate Programs. The Department of Botany offers graduate work leading to the Master of Science and Doctor of Philosophy. It also participates in interdepartmental study programs leading to doctoral degrees in cell biology and virology, environmental biology, genetics, and plant physiology.

Areas of specialization available within the department include: anatomy; cytology; development; ecology; genetics, mycology; paleobotany; photosynthesis; phycology; physiology; systematics; and virology. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization, and a knowledge of the principles of ecology, genetics, morphology, pathology, physiology, and systematics is of great importance.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Applicants should have an admission average of 4.0, but those with averages between 3.75 and 4.0 are also considered.

Master of Science. Candidates for the M.S. are expected to fulfill the requirements of the Graduate College, and to broaden and deepen their training in a program of course work agreed upon with a faculty adviser. There is no foreign language requirement for this degree. A thesis may be required at the option of the candidate's adviser.

Doctor of Philosophy. Candidates for the doctorate are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser.

As each student nears completion of his first eight units of graduate study, three or more faculty members (other than the student's adviser) who are expected to serve on the Ph.D. preliminary examination committee evaluate his progress. These committee members have the responsibility of making recommendations to the student and his adviser on whether the student should be allowed to continue for the Ph.D., and on the content of the remaining portion of the student's graduate program. Candidates who enter with a master's degree from another institution are required to meet with their committee members as soon as possible after they have chosen an adviser.

For the Ph.D. the department requires a minimum of one foreign language, ordinarily chosen from the following: French, German, Latin, Russian, or Spanish. The adviser may require more than one foreign language, depending on the research literature in the candidate's field of specialization. The candidate may satisfy the minimal departmental requirement as follows: two years of college credit or three years of high school credit in the language, completion of the reading course with an A or B grade, or a score in the Educational Testing Service language exam approximately equivalent to the sixtieth percentile. Any language requirement additional to the minimal departmental requirement need not be completed before taking the doctoral preliminary examination.

Entomology

Head of the Department: Joseph R. Larsen
Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois, 320 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: G. Fraenkel, S. Friedman, A. W. Ghent, W. R. Horsfall, E. R. Jaycox, C. W. Kearns, W. E. Laberge, J. R. Larsen, W. H. Luckmann,

R. L. Metcalf, R. B. Selander, L. J. Stannard, J. G. Sternburg, G. P Waldbauer
Associate Professors: E. G. Macleod, J. H. Willis
Assistant Professors: G. M. Booth, P. W. Price

Graduate Programs and Admission. The Department of Entomology offers graduate work leading to the Master of Science and Doctor of Philosophy. The admission average is 4.0, but applications of students with averages below 4.0 but above 3.75 are considered on an individual basis. Previous training in entomology is not essential. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the fundamentals of physical and biological science, mathematics, and the liberal arts.

Master of Science. A candidate for the M.S. is required to demonstrate competence in insect bionomics, control, morphology, physiology, and taxonomy. This may be done by completing with a grade of B or better courses in the following areas: the classification of insects; insect control; insect bionomics; insect morphology; and insect physiology; by passing examinations in these subjects; or by a combination of these methods. Proficiency examinations are given by the department in the week before each semester begins. Electives, including thesis research, make up the balance of the eight-unit requirement. If research credit is presented, a thesis is required.

Doctor of Philosophy. A candidate for this degree must satisfy the requirements for the Master of Science in Entomology. The rest of the candidate's program is determined in consultation with his adviser and representatives of the department or departments in which the minor courses are taken. All minor credit must be earned outside the department. The minor or minors are generally selected from the biological and physical sciences.

The chief areas of specialization in the department are behavior; bionomics; economic entomology; medical entomology; morphology; physiology; taxonomy; and toxicology. The facilities of both the department and the State Natural History Survey are available for advanced study in these areas.

Microbiology

Head of the Department: R. D. DeMoss
Correspondence and Information: Department of Microbiology, University of Illinois, 131 Burrill Hall, Urbana, Illinois 61801

FACULTY

Professors: M. P. Bryant, L. L. Campbell, R. D. DeMoss, J. W. Drake, R. E. Kallio, Z. J. Ordal, M. E. Reichmann, C. R. Woese, R. S. Wolfe, M. J. Wolin
Associate Professors: S. Kaplan, R. C. Meyer, E. W. Voss, J. T. Wachsman
Assistant Professors: D. D. Burke, P. L. Carl, M. G. Gabridge, A. C. Helm, C. L. Hershberger, J. Konisky, P. R. Starr, M. J. Weber

Graduate Programs. The Department of Microbiology offers graduate work leading to the Master of Science and Doctor of Philosophy. For both degrees, the program provides a strong basic background in microbiology, biochemistry, and genetics. Students completing the program are qualified for positions in academic, industrial, or governmental environments and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Admission and Aid. Students electing microbiology as a major for an advanced degree should have had, in addition to formal training in general biology or microbiology, chemistry through quantitative analysis and organic chemistry, and fifteen hours of physical or biological sciences. Mathematics through calculus is strongly recommended. The admission average is 4.0.

Financial aid is available in the form of fellowships, traineeships, and waivers of tuition and fees. Employment in the form of teaching assistantships and research assistantships is available to a limited number of students.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees. Study programs are flexible and are dependent upon the experience, interests, and goals of each student.

Cell Biology, Genetics, and Molecular Biology. Candidates in interdisciplinary graduate programs may, with the approval of the appropriate program committee, select certain departmental faculty as research advisers.

Specialization in Molecular Biology (Biophysical Chemistry). The Department of Microbiology in collaboration with the School of Chemical Sciences offers an area of specialization in molecular biology. The program is flexible and provides the doctoral candidate with basic training in biology and physical biochemistry. Students electing this area should possess a solid background in physics and mathematics. Details of the curriculum are decided individually, on the basis of the past experience and interests of the student. It is expected, however, that he will fulfill minor requirements in biochemistry or physical chemistry.

The major research areas are the following: molecular basis of gene function; structure and activities of proteins and nucleic acids; intracellular organization and distribution of nucleoprotein components; biosynthetic mechanisms of macromolecular replication; and immunochemistry.

Physiology and Biophysics

Head of the Department: William W. Sleator
Correspondence and Information: Department of Physiology and Biophysics, University of Illinois, 524 Burrill Hall, Urbana, Illinois 61801

FACULTY

Professors: H. W. Ades, J. D. Anderson, L. Barr, D. E. Buetow, H. S. Ducoff, F. Dunn, C. Gianturco, J. Gorski, Govindjee, R. E. Johnson, J. R. Larsen, A. V. Nalbandov, C. L. Prosser, W. W. Sleator, H. I. Teigler, A. R. Twardock, H. M. Von Foerster, G. Weber
Associate Professors: E. Donchin, J. E. Heath, B. A. Hertig, S. G. Stolpe, D. C. Sweeney, J. S. Willis
Assistant Professors: D. J. Barker, J. A. Connor, J. C. Cooley, J. A. Harris, G. L. Jendrasiak, B. S. Katzenellenbogen, J. E. Zehr

Graduate Progams: The Master of Science and Doctor of Philosophy degrees are granted in both physiology and biophysics.

PHYSIOLOGY

Admission and Aid. Applicants for graduate study in physiology are screened

by an admissions committee and normally are admitted if their admission average is 4.0 or better and if their background training is adequate. Applicants with averages between 3.5 and 4.0 are considered, and may be admitted if their performance indicates adequate improvement, and if letters of recommendation indicate ability for graduate work. Traineeships, as well as teaching and research assistantships, are available for qualified students.

Master of Science. A master's degree requires eight or more units of graduate work drawn from the offerings of this and other departments. Each student must submit a report based on original research and pass an oral examination administered by the physiology qualifying committee.

Doctor of Philosophy. Every candidate for the Ph.D. is required to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology, as well as a high degree of expertise in his area of specialization. He is also expected to develop proficiency in other appropriate disciplines, such as biochemistry, physical chemistry, statistics, and the history and philosophy of science. Normally each student is expected to gain a year of experience as a teaching assistant.

The preliminary examination is taken after completion of at least sixteen units of graduate course work, completion of all courses specified by the student's advisory committee, and after satisfying the foreign language requirement. A thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the branches of physiology must be presented to a review committee before the final examination.

BIOPHYSICS

Admission and Aid. The objective of the program in biophysics is to give the student sufficient training in physics, chemistry, and biology to enable him to apply the conceptual, instrumental, and mathematical approaches of the physical scientist to the solution of biological problems. The curriculum is designed primarily for students entering with previous training in the physical sciences, but students with a background only in biology may be eligible. Admission requirements are one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics through calculus. In exceptional cases deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0. A limited number of traineeships and assistantships are available for qualified students.

Master of Science. To obtain the Master of Science, the student must offer at least eight units in biophysics and related subjects including two biophysics core courses. A thesis or examination in a specialized field is also required.

Doctor of Philosophy. A flexible approach is made to curriculum requirements, but an acceptable course program should include the following: (1) Physical sciences: mathematics through differential equations; a one-year sequence in physical chemistry; biochemistry with laboratory; classical mechanics, electromagnetic field theory, and elementary quantum mechanics. (2) Biological sciences: three units of graduate course work in one of the major areas of biology, determined by the research interests of the student. (3) Biophysics: satisfactory completion of two biophysics core courses and two additional courses in biophysics (other than research). (4) Other areas: students entering from the biological sciences may present a minor in physics or chemistry, or in both, utilizing required courses in these fields, while students entering from the physical sciences may present courses in a selected field of biology. Other subjects are possible but must meet the approval of the faculty.

After completion of eight units of course work the student is required to take a qualifying examination for the purpose of diagnosing inadequacies in his training. Successful completion of the preliminary examination after at least sixteen units of formal course work admits the student to candidacy for the degree of Doctor of Philosophy. Normally each student is expected to gain one semester of teaching experience. A thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the areas of biophysics must be presented to a review committee a suitable interval prior to the final examination.

Zoology

Head of the Department: Robert L. Metcalf
Correspondence and Information: Department of Zoology, University of Illinois, 287 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: E. M. Banks, G. W. Bennett, L. L. Getz, A. W. Ghent, B. V. Hall, H. C. Hanson, J. Hirsch, D. F. Hoffmeister, L. Ingle, S. C. Kendeigh, J. B. Kitzmiller, F. J. Kruidenier, R. W. Larimore, N. D. Levine, R. L. Metcalf, A. V. Nalbandov, D. L. Nanney, C. L. Prosser, G. C. Sanderson, P. H. Silverman, P. W. Smith, R. L. Watterson
Associate Professors: N. E. Alger, E. H. Brown, R. Davenport, D. C. Eades, T. H. Frazzetta, J. E. Heath, G. H. Kieffer, M. R. Lee, M. R. Matteson, M. Salmon, H. H. Shoemaker, D. C. Sweeney, M. F. Willson
Assistant Professors: G. O. Batzli, W. Daniel, A. Gramza, L. Klein, H. V. Leland, D. L. Stocum, I. D. Unzicker, G. S. Whitt

Graduate Programs. The Department of Zoology offers work leading to the degrees of Master of Science and Doctor of Philosophy. Several areas of specialization are available.

Admission. The required admission average is 4.0. Applicants with grade-point averages below 4.0 but above 3.75 are considered on an individual basis. Applicants should have completed twenty-five hours of biology, three semesters of college chemistry including biochemistry, mathematics through calculus, and two semesters of physics, or equivalent. Deficiencies may be made up after entry into the graduate program. Knowledge of a foreign language is necessary and the following are recommended: French, German, and Russian.

Master of Science. The Master of Science requires eight units of graduate credit. Many of the courses listed under biology are taught by members of the Department of Zoology. Biology courses may be utilized toward meeting the requirements of degrees in zoology in the same manner as zoology courses. At the end of the program each student must successfully complete a comprehensive examination. In addition, he may be required to complete a thesis or a research project.

Doctor of Philosophy. Admission to advanced standing requires the master's degree or the equivalent and a 4.0 average in nonthesis biology courses, and presupposes that the minimum science requirements specified for the master's degree have been met. One course in statistics is required. Additional courses in other areas may be recommended by the adviser or doctoral committee.

LINGUISTICS

(Including Arabic, Modern Hebrew, Hindi, Modern Greek, Swahili, and Yoruba)

Head of the Department: Braj B. Kachru
Correspondence and Information: Department of Linguistics, University of Illinois, 4088 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. H. D. Allen, E. H. Antonsen, K. O. Aston, J. B. Casagrande, C. L. Dawson, B. B. Kachru, Y. Kachru, H. R. Kahane (emeritus), C-W. Kim, F. K. Lehman, H. Maclay, J. W. Marchand, M. A. Morinigo, C. Osgood, L. Zgusta
Associate Professors: R. Dunatov, F. S. Gladney, F. M. Jenkins, C. W. Kisseberth, S. Makino, I. Rauch, M. Saltarelli, W. R. Zemlin
Assistant Professors: L. F. Bouton, C-C. Cheng, W. B. Dickerson, G. M. Green, H. H. Hock, M. J. Kenstowicz, H. F. W. Stahlke, D. Wanner

Graduate Programs. The Department of Linguistics offers a graduate program leading to the Master of Arts and Doctor of Philosophy. Work toward these degrees is broken down into several specialized areas under the general division of historical, descriptive, theoretical, and applied linguistics; further specialization includes comparative linguistics, historical linquistics, Romance linguistics, articulatory and acoustic phonetics, psycholinguistics, mathematical and computational linguistics, sociolinguistics, and stylistics.

Graduate courses are offered in Arabic, Modern Hebrew, Hindi, Modern Greek, Swahili, and Yoruba.

Admission and Aid. Undergraduate preparation for the study of linguistics should include the equivalent of at least three years of foreign language experience; for historical linguistics, a broad background in the humanities and social studies; and for descriptive linguistics, the equivalent of good undergraduate training in mathematics and the sciences. Students applying for admission should have an admission average of at least 4.0. Applications from students with admission averages between 3.5 and 4.0 are considered on an individual basis. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Arts. The aim of the master's program is to instruct students in the important areas of linguistics and the methods of linguistic analysis. Candidates for this degree must earn eight units, of which six units must be in linguistics and must include courses in general linguistics, phonetics, syntax, phonology, comparative, and historical linguistics. Specific required course numbers are available in the department. In addition, the student must pass a reading examination in French, German, or Russian (or any other language which the student's advisory committee considers important for the academic interests and research of the candidate), pass the comprehensive qualifying examination in general linguistics (and special subjects, if appropriate), and submit a satisfactory master's essay to the department. Admission to the qualifying examination is contingent upon success in the language examination.

Doctor of Philosophy. Admission to candidacy for the Ph.D. normally requires an average of 4.5 or better for all graduate work in linguistics and distinction in passing the comprehensive qualifying examination. Candidates for this degree must complete at least twenty-four units of graduate work, or sixteen units beyond the master's degree. The minimum twenty-four units must include the

course requirements listed above for the master's degree (or their equivalent), courses in advanced syntax, advanced phonology, courses in the structure of non-Western languages, and eight units of thesis research. Candidates must also demonstrate proficiency in a second language other than English. However, this second language requirement is made flexible depending on the research interest of the student. The candidate is required to take the preliminary examinations (written and oral) after completion of eight units beyond the master's level. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to two units of credit granted by the host university under this program may be transferred. Students of descriptive linguistics also are urged to establish a vested interest and a firm basic foundation in some particular language family as early as possible in their graduate career. Linguistically oriented courses in related departments may be counted toward the major if approved by the adviser. The head of the department acts as general adviser to each student until he selects his field of concentration, at which time he comes under the guidance of an adviser in his special area.

MATHEMATICS

(Including Statistics)

Head of the Department: Paul T. Bateman
Graduate Supervisor: James W. Armstrong
Correspondence and Information: Graduate Supervisor, Graduate Advising Office, Department of Mathematics, University of Illinois, 259 Altgeld Hall, Urbana, Illinois 61801

FACULTY

Professors: F. R. Albrecht, R. B. Ash, S. B. Bank, R. G. Bartle, P. T. Bateman, R. L. Bishop, C. R. Blyth, W. W. Boone, P. G. Braunfeld, D. L. Burkholder, R. W. Carroll, K. T. Chen, E. C. Dade, M. M. Day, H. G. Diamond, J. L. Doob, R. M. Fossum, C. W. Gear, D. B. Gillies, S. I. Goldberg, J. W. Gray, W. R. G. Haken, M. E. Hamstrom, M. H. Heins, L. L. Helms, F. E. Hohn, R. P. Jerrard, F. W. Kamber, R. P. Kaufman, F. B. Knight, R. G. Langebartel, D. E. Muller, H. O. Osborn, E. T. Parker, A. L. Peressini, I. Reiner, N. T. Rothman, J. J. Rotman, L. A. Rubel, E. J. Scott, M. Suzuki, G. Takeuti, T. W. Ting, P. M. Tondeur, H. E. Vaughan, J. H. Walter, R. A. Wijsman, J. Wolfowitz

Associate Professors: J. R. Alexander, Jr., K. I. Appel, J. W. Armstrong, A. Babakhanian, I. D. Berg, E. R. Berkson, B. C. Berndt, R. E. Bohrer, J. W. Brown, W. A. Ferguson, R. L. Finney, P. A. Griffith, G. J. Janusz, C. G. Jockusch, S. S. Jogdeo, P. A. Loeb, L. R. McCulloh, T. G. McLaughlin, J. Nievergelt, C. F. Osgood, H. Paley, N. T. Peck, W. Philipp, R. R. Rao, D. J. S. Robinson, J. E. Schubert, P. E. Schupp, D. R. Sherbert, J. J. Uhl, Jr., P. M. Weichsel, E. C. Weinberg, J. E. Wetzel, K. G. Witz, W. M. Zaring

Assistant Professors: S. B. Alexander, F. D. Bateman, H. E. Benzinger, Jr., A. J. Berkson, G. A. Converse, R. F. Craggs, C. D. Dade, L. Dornhoff, G. Francis, E. W. Gray, H. P. Lotz, J. B. Miles, C. Phillips, H. A. Porta, I. W. Reiner, J. M. Steinig, K. B. Stolarsky, W. F. Stout, K. K. Uhlenbeck, S. V. Ullom

Graduate Programs. The Department of Mathematics offers graduate work leading to the Master of Arts or Master of Science in Mathematics and Doctor of Philosophy in Mathematics, Master of Science in the Teaching of Mathematics, and Master of Arts or Master of Science in Statistics and Doctor of Philosophy in Statistics. Graduate study in areas of applied mathematics is available in conjunction with other departments of the University. See below.

Admission. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics and have an admission average of at least 3.75. Applications from students whose average is below 3.75 but above 3.5 are considered on an individual basis. Students whose undergraduate training in mathematics is deficient will not be admitted to full standing but may be admitted with deficiencies to be removed during the first year of graduate study.

Statistics. This program of study is for those who wish to concentrate on research in the theory of statistics, and to provide training in the theory and practice of statistical inference from quantitative data. It also provides an appropriate minor for those who wish to develop competence in an area of application of statistics, such as agronomy, biology, chemistry, economics, education, geology, physics, or psychology.

Master's Degree Programs. The various master's degrees offered by the department are designed to be completed in one year of full-time study by students entering on full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. No thesis is required for any of these degrees. There is no language requirement. Precise statements of degree requirements may be obtained from the Graduate Supervisor.

Doctoral Degree Programs. Students working toward one of the doctoral degrees usually require from four to six years to complete the requirements. These students must pass the qualifying examination (testing the content of undergraduate courses in abstract and linear algebra and real and complex analysis) and the preliminary examination (testing the content of four areas of graduate mathematics selected by the student and approved by the department), and write a thesis in an area of mathematical research. The time required to complete the thesis is usually from one to two years. A reading knowledge of two of the following languages is required: German, French, or Russian.

MATHEMATICS (APPLIED)

Graduate Programs. A wide variety of courses in applied mathematics, covering among others the fields of mechanics of particles and of rigid bodies, the mechanics of continuous media, electromagnetic theory, and mathematical methods, is offered by various graduate departments in the sciences and engineering. A graduate student interested in applied mathematics should register as a major in the department of his choice. In consultation with his adviser he should plan a basic course of study which will serve as preparation for subsequent specialization and research in the theoretical aspects of one or more of the following fields: aerodynamics and hydrodynamics, astronomy, elasticity and plasticity, electrical theory, mathematics, mathematical meteorology, or the mathematical problems related to digital computer use and design.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: H. H. Korst
Associate Head of the Department: J. W. Bayne
Chairman of the Graduate Committee: S. L. Soo
Correspondence and Information: Chairman of the Graduate Committee, Department of Mechanical and Industrial Engineering, University of Illinois, 144 Mechanical Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: H. D. Bareither, J. W. Bayne, E. L. Broghamer, B. T. Chao, J. C. Chato, W. L. Chow, L. E. Doyle, G. W. Harper, E. F. Hebrank, J. A. Henry, W. L. Hull, H. H. Korst, J. L. Leach, R. J. Martin, L. C. Pigage, E. I. Radzimovsky, F. Seyfarth, S. L. Soo, W. F. Stoecker, K. J. Trigger
Associate Professors: A. L. Addy, W. E. Bair, A. M. Clausing, M. I. Dessouky, B. A. Hertig, B. G. Jones, R. E. Klein, C. S. Larson, F. A. Morrison, D. H. Offner, L. D. Savage, Jr., R. P. Strout, J. J. Stukel, J. L. Whisenand, R. A. White
Assistant Professors: R. E. DeVor, C. O. Pedersen

Graduate Programs. The Department of Mechanical and Industrial Engineering offers work leading to the Master of Science and Doctor of Philosophy. A student may specialize in any of the major core areas, including gas dynamics; heat transfer; thermodynamics; machine design; internal combustion engines; combustion; environmental control; environmental engineering and air pollution controls; hydrodynamics of suspensions; bioengineering; industrial engineering; operations research; controls; and production engineering.

Admission and Aid. The minimum admission average is 4.0. However, those students with an average between 3.60 and 4.0 will be considered on an individual basis after review by a faculty committee for the core area. The Graduate Record Examination is not required by the department. Based upon the previous preparation of the student, one or more prerequisite courses may be specified by the adviser, but the credit may not apply to the degree. For example, those without experience in digital and analog computers may be required to obtain proficiency in these areas. Financial aid is available to a limited number of students in the form of fellowships and traineeships, industrial and University-sponsored fellowships, teaching and research assistantships, and tuition waivers.

Master of Science. A thesis is required, but can be waived for students terminating their studies with the M.S. degree. A total of eight units (including thesis credits) is required. A full-time student can complete this program in an academic year. Those not writing a thesis are required to offer a minimum of nine units of credit. In such cases, the study program includes one or more units of laboratory investigations, since each student is required to show evidence of ability to do independent study.

Doctor of Philosophy. A master's thesis (or equivalent) is required for all applicants for Ph.D. study. Those students who enter with a master's degree, and who have not written a thesis or equivalent, will be required to register in laboratory investigations during their first semester of residence on the campus for the purpose of demonstrating their ability to do independent research. Qualifying examinations are to be taken during the last semester of master's study. Those from other schools entering with a master's degree must take qualifying

examinations no later than the second calendar semester. A total of sixteen units of course work beyond the B.S. degree is a minimum requirement for the Ph.D. degree. In order to be accepted as a final doctoral candidate, the student must prepare a thesis proposal and take an oral preliminary examination. If successful, the candidate completes his thesis work and takes the final oral examination.

METALLURGY AND MINING ENGINEERING

Head of the Department: C. A. Wert
Correspondence and Information: Head of the Department, Department of Metallurgy and Mining Engineering, University of Illinois, 201 Metallurgy and Mining Building, Urbana, Illinois 61801

FACULTY

Professors: C. J. Altstetter, P. A. Beck, H. K. Birnbaum, R. W. Bohl, A. J. deWitte, E. J. Eckel, G. Ehrlich, D. S. Lieberman, M. Metzger, B. G. Ricketts, H. E. Risser, T. J. Rowland, C. M. Wayman, C. A. Wert
Associate Professors: D. Bond, E. N. Pugh, J. A. Simon
Assistant Professors: J. E. Greene, F. V. Lawrence, Jr.

Graduate Programs. The Department of Metallurgy and Mining Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy. The faculty has a widely varied background of engineering and science, and graduates go into a broad range of industrial, government, and university positions. Close association exists with staff members in other departments having programs in the properties of solids.

Admission and Aid. Graduate students in metallurgy or mining engineering may have undergraduate degrees in a number of disciplines. Graduates with degrees in metallurgy or mining engineering fit into the graduate programs easily, as well as the many graduate students who come from other engineering or science disciplines. Graduates of departments of mechanical engineering, physics, chemistry, and ceramics are represented among our student body. Financial aid is available to qualified students in the form of fellowships, research assistantships, and waivers of tuition and fees.

Master of Science. A candidate for the Master of Science is required to have a minimum of eight units of graduate work, including a thesis. If a petition to waive the thesis is granted, a minimum of nine units of graduate work is required. A thesis is required of candidates who hold research assistantships.

Doctor of Philosophy. Students desiring to work for the Doctor of Philosophy are required to pass the departmental qualifying examination. This examination must be taken no later than the end of the first semester after receiving the Master of Science from this department, or not later than the end of the second semester in residence, if the student has a Master of Science from some other department or university.

The minor requirement of the department for the Doctor of Philosophy may be satisfied by taking courses in fields such as ceramics, chemistry, geology, mathematics, theoretical and applied mechanics, nuclear engineering, and physics. Although reading knowledge of a foreign language is helpful, there is no formal requirement.

MUSIC

(Including Music Education and Musicology)

Director of the School of Music: Thomas Fredrickson
Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois, 100 Smith Music Hall, Urbana, Illinois 61801

FACULTY

Professors: J. L. Bailey, H. Begian, E. S. Berry, A. M. Carter, W. R. Coggins, R. J. Colwell, H. A. Decker, C. DeLaney, G. M. Duker, B. E. Edlefsen, P. S. Farrell, T. Fredrickson, J. C. Garvey, B. M. Goodman, R. E. Gray, D. Gunsalus, J. Hamilton, C. E. Hamm, T. L. Holden, G. H. Hunter, B. B. Johnston, H. Karp, J. R. Kelly, C. Kirk, E. D. Kisinger, E. J. Krolick, C. Leonhard, D. Lloyd, E. London, A. J. McDowell, J. McKenzie, W. Miller, B. Nettl, P. S. Pettinga, C. Richards, A. L. Ringer, P. Rolland, D. W. Sanders, H. C. Schmitt, H. O. Sexton, R. B. Smith, S. Stravinsky, R. H. Swenson, R. E. Thomas, G. Wilson, J. Wustman

Associate Professors: J. W. Beauchamp, G. Behague, H. Brűn, M. Burdette, E. L. Dalheim, M. Elyn, R. Hedlund, W. H. Heiles, A. L. Johnson, H. Kellman, D. Kimpton, D. M. Kohut, J. B. Lyke, S. Martirano, D. L. Miller, E. Noth, P. Painter, G. Perich, E. Reynolds, N. M. Temperley, T. J. Wisniewski

Assistant Professors: R. Aslanian, N. Bruce, R. Byrnside, F. Crawford, C. L. Gonzo, R. Newell, W. W. Olson, D. T. Perantoni, M. Powell, R. J. Ray, Jr., J. Shapiro, T. V. Siwe, I. Thomas, T. Ward, P. Zonn

Graduate Progams. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the M.Mus. degree are musicology; music theory and composition; and performance and literature (piano, organ, voice, violin, viola, cello, wind instruments, and percussion instruments).

Admission. Requirements for admission are a Bachelor of Music degree from the University of Illinois, or an equivalent degree from another accredited institution (students holding other degrees may be admitted, but will be expected to make up any deficiencies), and an admission average of 3.5. For those majoring in musicology, the minimum average is 4.0.

Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings.

Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Language Requirements. Applicants in voice are required to have had one year each at the college level, or two years at the high school level, of French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students otherwise admissible must satisfy any language deficiencies.

Entrance Examinations. All prospective candidates for the M.Mus. degree must pass entrance examinations in music history and theory. These examinations are to be given immediately prior to the student's first registration.

Degree Requirements. Candidates for the M.Mus. in theory-composition and in performance and literature must earn at least eight units, including two units at the 400 level in their major field, and one unit in problems and methods. Candidates in performance and literature must earn two units in the music literature course in their major applied area. Additional electives in music theory, history, and literature, and other music and nonmusic courses will be chosen in consultation with the candidate's graduate adviser. A graduate recital is required of all candidates in performance and literature. However, the recital required of voice majors may, by collective action of the voice division, be waived. Candidates in musicology and theory must write a thesis, for which two units of credit are given.

Doctor of Musical Arts. The fields of specialization for the D.M.A. degree are composition; piano; organ; choral music; voice; violin; viola; cello; and wind instruments.

Admission. Prerequisites for admission are: (1) The M.Mus. degree from the University of Illinois, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above. (2) A high level of proficiency in composition or performance. Candidates in composition must submit original scores for review. Candidates in performance and literture must pass a qualifying audition or submit satisfactory recordings. (3) Appropriate experience in ensemble playing and/or score reading. (4) The successful completion of approximately thirty-two semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of six hours each in general history, literature or philosophy, or both. Candidates in voice must have fulfilled all foreign language requirements considered as prerequisites for the M.Mus. (See page 100.) (5) The successful completion of entrance examinations in music history and theory for the M.Mus.

Degree Requirements. Candidates must earn a minimum of sixteen units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interest, and abilities; it will ordinarily include a minimum of three units in the major field of specialization, two units in advanced music literature courses, and two units in a minor field.

Language Requirements. German and at least one other language must be acquired in accordance with the student's special interests and goals. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition, and performance and literature, three units are applied to a special doctoral project. Composers must produce a large-scale original score, while performers must demonstrate comprehensive repertory study in the form of two solo recitals, or one solo recital and two of the following options: a. concerto; a major operatic or oratorio role; a chamber music program; a lecture-recital; or the preparation and, when appropriate, conducting of a concert by an instrumental or vocal ensemble.

Two units are devoted to the writing of a thesis related to the student's special interests. In the field of choral music four units are counted toward the thesis, while one unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory. Alternatives to the thesis requirement are under consideration.

Doctor of Philosophy in Musicology. The Ph.D. in musicology is intended for those whose interests lie in research in the history of music, ethnomusicology, theory of music, psychology, and philosophy of music.

Admission. Prerequisites for admission are: (1) The M.Mus. in musicology from the University of Illinois, or an equivalent degree from another accredited institution. (2) A minimum of thirty-two semester hours in the liberal arts and sciences, normally including general history, philosophy, and literature. (3) The successful completion of entrance examinations in music history and theory for the M.Mus.

Degree Requirements. A minimum of sixteen units of credit must be earned beyond the requirements of the master's degree, including at least two units in the seminar in musicology. Two units are normally devoted to a nonmusic minor determined in accordance with the student's particular research plans. No more than two units may be earned in applied music.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester 400-level reading course with a grade of at least C, or by satisfactory test scores.

Thesis. Eight of the total of sixteen units are normally devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 3.5. Candidates for this degree must earn a minimum of four units in music courses, two units in education courses, and two units of electives. One of the four units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in the major performing medium during the registration period of their first session in residence. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

An alternate program for Bachelor of Music graduates requires four units in music courses, one unit in educational psychology, one unit in history and philosophy of education, two units of electives, and nine hours of undergraduate professional education including six hours in student teaching. Enrollment in a summer session contiguous to the year of residence is required.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have completed satisfactorily two years of professional employment in music education. At first registration, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of eight units beyond the master's degree is required, including one unit in music education courses and one unit in educational psychology. Students not holding a valid teaching certificate in music must fulfill certification requirements of the state in which they are employed.

Doctor of Education in Music Education. This program, offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music or music education. Admission is determined by examinations in music history, music theory, music education and applied music; personal interviews; record of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies Test should accompany his application for admission.

Program. At least sixteen units of work beyond the master's degree are required, including six units in music courses and six units in education courses. No more than two units of credit in applied music may be counted toward the degree. A thesis is required. It may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled by full-time study in two consecutive semesters or in one semester, a contiguous summer session, and one additional summer session.

NUCLEAR ENGINEERING

Chairman of the Program: Marvin E. Wyman
Correspondence and Information: Nuclear Engineering Office, University of Illinois, 214 Nuclear Engineering Laboratory, Urbana, Illinois 61801

FACULTY

Professors: F. T. Adler, A. W. Allen, R. A. Axford, R. W. Bohl, A. P. Boresi, B. T. Chao, J. C. Chato, A. B. Chilton, G. A. Costello, H. S. Ducoff, B. B. Ewing, O. L. Gaddy, L. Goldstein, D. F. Hang, C. D. Hendricks, J. P. Hummel, J. S. Koehler, R. J. Martin, M. S. McVay, G. H. Miley, J. E. Pearson, S. L. Soo, J. T. Verdeyen, M. E. Wyman
Associate Professors: B. E. Cherrington, J. J. Dorning, B. G. Jones, H. Merkelo, B. W. Wehring

Graduate Programs. Nuclear Engineering offers work leading to the Master of Science and Doctor of Philosophy and provides courses and research facilities for doctoral candidates in nuclear engineering and related fields.

Admission. The program in nuclear engineering is open to all graduates in engineering, mathematics, and the physical sciences who have an admission average of at least 4.0. Students with grade-point average below 4.0 but above 3.5 are considered individually. Applicants who fall into this latter category are invited to support their applications with a letter explaining the circumstances. It is recommended that they also submit letters of reference and information as to their rank in class.

Undergraduate courses in differential equations, advanced calculus, and atomic physics are required as background for the nuclear engineering program. A student may be admitted before he has completed these three prerequisites, but he must then allow an additonal semester or summer of study for the completion of the master's degree.

Degree Requirements. The general requirements of the Graduate College must be met for either degree. A candidate for the M.S. degree who does not submit a thesis must complete nine units of graduate work.

Facilities. The Illinois Advanced TRIGA reactor is located on campus for research and teaching in nuclear engineering and operates at a steady state power of 1.5 megawatts. The reactor can be pulsed to power levels of 6,000 megawatts for special studies. Teaching facilities include a nuclear metallurgy laboratory, a radiochemistry and nuclear instrumentation laboratory, a heat transfer, fluid flow, and turbulence laboratory, several subcritical natural uranium assemblies, a radioactive waste disposal laboratory, a radiation shielding laboratory, a direct energy conversion laboratory, and a thermonuclear systems laboratory.

NUTRITIONAL SCIENCES

Chairman of the Committee on Nutritional Sciences: H. H. Draper
Correspondence and Information: Nutritional Sciences Program, University of Illinois, 567 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: C. L. Davis, H. H. Draper, R. M. Forbes, K. E. Harshbarger, F. A. Kummerow, S. P. Mistry, T. Nishida
Associate Professors: D. H. Baker, B. E. Haskell, P. V. Johnston, E. G. Perkins
Assistant Professor: D. E. Bauman

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science and Doctor of Philosophy in Nutritional Sciences is offered under the auspices of the Committee on Nutritional Sciences. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes, animals, and man; nutritional biochemistry, the chemistry of nutritional compounds; the epidemiology of nutritional diseases; and the socioeconomic aspects of human nutrition.

Admission and Aid. Applicants are expected to have an admission average of 4.0 and sound basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study. Financial assistance is available in the form of assistantships, fellowships, and traineeships.

Master of Science. Requirements for the M.S. include an advanced course in comparative nutrition, two semesters of seminar, and completion of a satisfactory thesis. Additional courses are available in such diverse subjects as laboratory techniques in animal biochemistry, instrumental analysis, foods and nutrition, lipid metabolism, nutritional biochemistry, human and animal nutrition, food science, and the social sciences related to nutrition.

Doctor of Philosophy. In addition to maintaining a satisfactory average in formal course work, Ph.D. students are required to take a comprehensive oral preliminary examination and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to demonstrate competence in English.

PHILOSOPHY

Chairman of the Department: J. D. Wallace
Correspondence and Information: Director of Graduate Studies, Philosophy Department, University of Illinois, 105 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: C. E. Caton, B. J. Diggs, D. S. Shwayder, H. M. Tiebout, A. R. Turquette, J. D. Wallace, F. L. Will
Associate Professors: H. S. Chandler, R. L. Schacht
Assistant Professors: L. D. Gordon, P. G. Hugly, A. Melnick, F. W. Neely, T. J. Nickles, F. R. Suppe, R. G. Wengert

Graduate Programs. The normal program of graduate study for philosophy majors is directed toward the Doctor of Philosophy, but a limited number of students who wish to work for the Master of Arts are admitted. Graduate students majoring in other fields who wish to offer philosophy as a minor, or to include philosophy in their programs in a less formal way, are encouraged to consult with members of the graduate faculty in philosophy in order to plan appropriate courses of study.

Admission and Aid. The normal requirement for admission is an admission average of 4.0. In special cases applicants are admitted with averages lower than 4.0, but in no case where the average is less than 3.75.

Each student should have had a course in elementary logic, a course in the theory of knowledge, a course in ethics, and a general course in the history of philosophy (the main figures of ancient and modern philosophy). Students deficient in one or more of these areas may be admitted with deficiencies to be removed by taking courses recommended by the departmental Director of Graduate Studies after consultation with the student.

All applications for admission only, as well as applications for admission and financial aid, must be supported by three letters of recommendation. The letters should be in each case from persons qualified to speak of the candidate's aptitude for graduate study in philosophy. Candidates are asked to have these letters transmitted directly to the Committee on Admissions and Financial Aid of the Department of Philosophy.

All applicants for admission are required to take the General Aptitude portion of the Graduate Record Examination and to have their scores transmitted to the department.

Master of Arts. Each student who has passed his preliminary examination for the Ph.D. is automatically qualified by the department to receive the A.M. This degree may also be earned by completing one full year of residence study in philosophy at the University of Illinois, including six of the eight units required for the degree, submitting a substantial essay, and passing an oral examination on the essay given by a committee appointed by the chairman of the department. A degree earned in this way is normally a terminal one.

Doctor of Philosophy. In the preliminary examination, required of all candidates, each student is required to demonstrate a basic competence in the following four broad areas of philosophy: history of philosophy, theory of knowledge, metaphysics, and ethics and value theory.

Candidates are not generally required to offer work in a minor field outside the department. However, where a student's advanced study in philosophy would be strengthened by the inclusion of work in a related field, he may be advised to include such work in the courses taken to satisfy the requirements for the degree. The amount of such work is limited to two units, unless the student wishes

the work to count as an extradepartmental minor. Then the minimum work accepted is two units, the maximum four.

Prior to taking the preliminary examination each candidate is required to demonstrate a basic competence in mathematical logic. This may be done by passing an approved course in the subject or passing a proficiency examination administered by the department.

Subsequent to the preliminary examination, the student must submit an acceptable dissertation in one of the above four areas of philosophical research and pass a final examination on the dissertation. The acceptability of the dissertation is judged, and the final examination administered, by the student's doctoral committee.

PHYSICAL EDUCATION

Head of the Department: Rollin G. Wright
Correspondence and Information: Graduate Department of Physical Education, University of Illinois, 120 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professors: A. T. Cheska, A. W. Hubbard, L. J. Huelster, B. H. Massey, D. O. Matthews, K. J. McCristal, A. C. Moore, R. H. Pohndorf, R. E. Shelton, M. Thompson, R. G. Wright
Associate Professors: J. Davenport, P. Hill, W. Johnson, R. Keller, G. Lüschen, M. Souder, O. G. Young, M. Trekell, J. E. Razor
Assistant Professors: D. E. Arnold, J. W. Bell, R. A. Boileau, W. Considine, W. Dannehl, H. Deutsch, A. Hoyman, N. Jackson, T. Lohman, J. Misner, N. Parker, B. H. Williams

Graduate Programs. The Department of Physical Education offers graduate programs leading to the Master of Science, designed for teaching research competency, the Master of Science in the Teaching of Physical Education, emphasizing teaching competency, and the Doctor of Philosophy, designed for advanced scholarly research in one of three closely related areas: physical education, health and safety education, and recreation and park administration.

Admission and Aid. The admission requirements for the Master of Science and the Master of Science in the Teaching of Physical Education programs include: an admission average of 4.0; scores on the Miller Analogies Test and/or on the aptitude portion of the Graduate Record Examination; and three letters of recommendation. The admission requirements for the Doctor of Philosophy programs are basically the same with the following additions: graduation from an accredited master's program and a minimum average of 4.5 for graduate work completed.

The most common type of financial assistance is provided in the form of teaching assistantships. Assistantships may vary with respect to percentage of appointment and the amount of the stipend. Fellowships and research assistantships are available and are awarded to applicants with outstanding academic credentials.

Master of Science. A candidate for the Master of Science must complete eight units, four in physical education and two in another discipline. Two units of credit are earned while writing the thesis. Typically a full-time student can receive this degree in one academic year plus one summer session. There is no language requirement for this degree.

Master of Science in the Teaching of Physical Education. This program is primarily an advanced program for increasing teaching proficiency. Candidates for this degree must complete eight units: four units in physical education, two units in education, and two units of thesis credit. The thesis requirement may be waived upon approval of a petition, but the candidate must substitute two additional units of course work. Typically a full-time student can receive this degree in one academic year plus one summer session. There is no language requirement.

Doctor of Philosophy. This program permits specialization in one of three related areas: physical education; health and safety education; and recreation and park administration. Candidates must complete at least sixteen additional units beyond the master's and must demonstrate the ability to translate two foreign languages (French, German, Russian), or to read, write, and converse satisfactorily in one. Two additional approved graduate courses may be substituted for each of the two required foreign languages.

PHYSICAL SCIENCES

Correspondence and Information: Professor D. H. Secrest, University of Illinois, 155 Noyes Laboratory, Urbana, Illinois 61801

Graduate Programs. Two master's degrees in physical science are offered for active or intended secondary school teachers. Students applying for admission must have an admission average of at least 3.5.

A special program leading to the Master of Science in the Physical Sciences is available to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this progam are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa. No thesis is required, and all courses in physics, chemistry, geology, astronomy, and mathematics which normally give graduate credit are acceptable toward the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus, for which calculus is prerequisite. In addition, he must have met the requirements for teacher certification.

Candidates for the Master of Science in the Teaching of the Physical Sciences, which is distinct from the program described above, must earn four units in the physical sciences, two units in education (see page 27), and two units in electives. The courses in the physical sciences and the electives must be selected with the approval of the adviser. The electives may be in the physical sciences, in education, or in exceptional cases, in other fields. The student must also have met the requirements for teacher certification.

PHYSICS

Head of the Department: R. O. Simmons
Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois, Physics Building, Urbana, Illinois 61801

FACULTY

Professors: A. Abashian, F. T. Adler, J. S. Allen, D. Alpert, A. C. Anderson, G. Ascoli, P. Axel, J. Bardeen, G. A. Baym, F. C. Brown, R. M. Brown, M. K. Brussel, C. P. Flynn, H. Frauenfelder, D. M. Ginsberg, A. V. Granato, P. Handler, A. O. Hanson, J. P. Hummel, M. V. Klein, J. S. Koehler, L. J. Koester, U. E. Kruse, L. S. Lavatelli, D. Lazarus, E. M. Lyman, D. E. Mapother, R. J. Maurer, B. H. McCormick, T. A. O'Halloran, D. Pines, M. Raether, D. G. Ravenhall, C. S. Robinson, G. A. Russell, C. T. Sah, R. D. Sard, C. B. Satterthwaite, R. O. Simmons, C. P. Slichter, J. H. Smith, J. N. Snyder, H. J. Stapleton, A. Wattenberg, W. S. Williams, H. W. Wyld, M. E. Wyman

Associate Professors: J. H. Cahn, S-J. Chang, P. G. Debrunner, J. D. Dow, B. I. Eisenstein, J. B. Hartle, L. E. Holloway, S. Ichimaru, E. A. Jackson, L. M. Jones, J. M. Mochel, C. J. Pethick, F. M. Propst, R. L. Schult, J. D. Stack, J. D. Sullivan, D. C. Sutton, M. Wortis, J. A. Wright

Assistant Professors: H. Bohmer, K. Crawford, A. B. Kunz, D. W. Mortara, M. B. Salamon, B. A. Sherwood

Graduate Programs. The Department of Physics offers graduate work leading to the Master of Science, the Doctor of Philosophy, and the Master of Science in the Teaching of Physics.

There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, and surface physics; the properties of liquid helium; and plasma physics and aeronomy. Graduate study in areas of applied physics is available in conjunction with other departments in the University.

Admission. Requirements for admission to the Graduate College with a major in physics are twenty hours of physics, including a semester of intermediate theoretical mechanics; two semesters of intermediate electricity and magnetism or the equivalent, and excluding courses in general physics; and an admission average of 3.75. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study.

Master of Science and Master of Science in the Teaching of Physics. These programs require eight units of graduate courses, and are usually completed in one year of full-time study by students entering on full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. No thesis is required. There is no language requirement. Precise statements of degree requirements may be obtained from the Graduate Advising Office of the Physics Department.

Doctor of Philosophy. Students working for the Ph.D. usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following two years.

Departmental requirements for the Doctor of Philosophy, in addition to the general requirements of the Graduate College, are described in a pamphlet which may be obtained from the Graduate Advising Office of the Physics Department.

Related Programs. For information concerning Applied Physics (Mathematics) see page 97; for information about Biophysics see pages 47-48. A doctoral program in Chemical Physics is described on page 51.

PLANT PATHOLOGY

Head of the Department: Richard E. Ford
Correspondence and Information: Head of the Department of Plant Pathology, University of Illinois, 218 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: L. M. Black, J. C. Carter, R. E. Ford, J. L. Forsberg, J. W. Gerdemann, D. Gottlieb, A. L. Hooker, M. B. Linn, D. Powell, M. C. Shurtleff, J. B. Sinclair
Associate Professors: D. W. Chamberlain, J. D. Paxton, P. D. Shaw
Assistant Professors: E. E. Burns, D. I. Edwards, L. E. Gray, W. Hartstirn, H. Jedlinski, R. B. Malek, G. M. Milbrath, D. F. Schoeneweiss

Graduate Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the Master of Science and Doctor of Philosophy. All students are required to present themselves for an oral examination in plant pathology before three members of the staff during the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are: diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; fungicides; antibiotics; physiology of fungi; biochemistry of plant diseases; disease resistance; etiology; epiphytology; soil-borne diseases; mycorrhiza; and variability in plant pathogens.

Admission and Aid. The admission average is 3.75. Applications of students with averages of 3.5, but below 3.75, are considered on an individual basis. Financial aid is available to degree candidates in the form of fellowships, research and teaching assistantships (half-time), and waivers of tuition and fees.

Master of Science. A candidate for the Master of Science must complete eight units of credit including the presentation of an acceptable thesis, and pass an oral examination. Credit in equivalent courses earned at other institutions may be accepted, at the discretion of the department head. The candidate must maintain an average of 3.75 for the master's program. There is no language requirement.

Doctor of Philosophy. Students working toward the Ph.D. usually require three to five additional years beyond the master's. Eight units of course work, including required courses, must be completed beyond the master's to qualify for the preliminary examination. An oral preliminary examination before five faculty members, including three from the department and two from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable dissertation. There are no language or minor requirements. A grade-point average of at least 4.0 is required for the Ph.D.

POLITICAL SCIENCE

Head of the Department: P. Monypenny
Correspondence and Information: Department of Political Science, University of Illinois, 361 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: M. Davis, S. K. Gove, E. G. Lewis, R. L. Merritt, P. Monypenny, S. S. Nagel, J. W. Peltason, R. E. Scott, G. T. Yu
Associate Professors: P. G. Bock, I. H Carmen, B. Carroll, S. P. Cohen, S. A. Douglas, A. B. Fields, B. Glad, M. Hobbs, G. Manner, R. F. Miller, T. Page, M. G. Weinbaum
Assistant Professors: R. S. Byars, F. S. Coombs, K. F. Johnson, J. Pisiciotte, M. E. Weinstein

Graduate Programs. The Department of Political Science offers work leading to the degrees of Master of Arts and Doctor of Philosophy. Graduate work is conducted in the following special fields: American government and politics; comparative government and politics; international law and relations; political behavior; political theory; and jurisprudence.

Admission. Admission to graduate work in political science requires an admission average of at least 4.0. Applications of students with grade-point averages below 4.0 but above 3.75 are considered on an individual basis. The student must also have had a minimum of twenty hours of undergraduate work in political science, economics, finance, sociology, or history, not less than twelve hours of which must have been in political science, which may include three hours in constitutional history.

Master of Arts. Requirements for the master's degree include eight units of credit, an acceptable thesis or substantial research essay in a departmental course, and either a proseminar in American government with a grade of A or B or passing the proficiency examination in American government.

The department also administers a program leading to the Master of Arts in Public Administration. An admission average of at least 3.75 and a study proposal leading to a well-defined career or professional objective, approved by the department, are required for admission. The program is matched to the individual needs and objectives of students. Programs for students without public service employment usually incorporate an internship of at least three months. Further information may be obtained from the department.

Doctor of Philosophy. A doctoral candidate must show competence in American politics, political theory, and scope and methods of political science. This competence may be demonstrated either by passing a proficiency in each area upon first entering the department, or by successfully completing specified courses in each of the areas.

Requirements also include passing a written and oral preliminary examination after completion of sixteen units. The preliminary examination tests competence in three areas of political science and in one outside minor area.

The department requires either demonstrated competence in foreign languages appropriate to the student's research interest, competence in quantitative methods and analysis, or a combination of these.

POPULATION STUDIES

Correspondence and Information: Paul Handler, Chairman, Population Studies Committee, University of Illinois, 312 Materials Research Laboratory, Urbana, Illinois 61801

Graduate Programs. The social implications of population growth are of considerable interest to many students. Since the approach to this area of study is multidisciplinary, the student who wishes to focus part of his program of study on this issue will be taking courses offered by several departments, including those available in the social sciences, the life sciences, and mathematics.

PSYCHOLOGY

Acting Head of the Department: Joseph E. McGrath
Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois, 305 Psychology Building, Champaign, Illinois 61820

FACULTY

Professors: J. A. Adams, H. W. Ades, R. C. Anderson, E. M. Banks, S. W. Bijou, R. B. Cattell, J. B. Cohen, F. Costin, J. H. Davis, D. E. Dulany, C. W. Eriksen, T. N. Ewing, M. Fishbein, R. E. Flexman, W. M. Gilbert, L. R. Goulet, H. W. Hake, R. Hamlin, J. Hirsch, C. O Hopkins, C. L. Hulin, L. G. Humphreys, J. McV. Hunt, W. E. Kappauf. L. H. Lanier, J. E. McGrath, O. H. Mowrer, C. E. Osgood, G. L. Paul, D. R. Peterson, K. E. Renner, S N Roscoe, R L. Sprague, M. M. Tatsuoka, H. C. Triandis, L. R. Tucker, M. Wagman, J. S. Wiggins
J. S. Wiggins
Associate Professors: D. Bishop, J. Campione, G. L. Clore, Jr., L. B. Cohen, E. Donchin, G. B. Graen, G. Z. Greenberg, K. T. Hill, A. K. Jonietz, R. P. Larsen, P. R. Laughlin, W. E. Montague, K. G. Scott, D. T. Shannon, W. M. Steinman, N. A. Wiggins
Assistant Professors: L. C. Ate, D. Bernstein, W. Brewer, B. J. Calder, M. Coles, A. Folsom, G. Gillmore, S. L. Golding, W. T. Greenough, H. M. Halff, L. E. Jones, W. B. Lawson, C. Lewis, D. Lieberman, J. W. Loeb, S. F. Maier, R. Malpass, W. R. Mead, J. Rappaport, R. C. Roistacher, G. R. Salancik, E. Seidman, P. Shaw, C. Trahiotis, R. C. Williges

Graduate Programs. The Department of Psychology offers graduate work leading to the degrees of Master of Arts, Master of Science, Doctor of Philosophy, and Doctor of Psychology.

Doctor of Philosophy programs are offered in the following areas of psychology: biological; child development; clinical and counseling; cognitive; engineering; industrial; learning; personality; quantitative; sensation-perception; and social. The Master of Arts degree is awarded to students in the above programs as an intermediate degree or as a terminal degree in engineering psychology. Master of Science programs are offered in personnel psychology and in quantitative psychology. The Doctor of Psychology degree is restricted to clinical and counseling psychology.

Admission and Aid. The candidate for admission to a Master of Arts or Doctor of Philosophy program should ordinarily have the following preparation: a

minimum of fifteen hours in psychology, a laboratory course in experimental psychology and a course in statistics, a one-year course in another laboratory science, an admission average of 4.0 and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have had some research experience.

The candidate for admission to a Master of Science program must ordinarily have completed an undergraduate major in the applied psychology curriculum at the University of Illinois. Students with an average of 3.5 may apply.

Admission to the Doctor of Psychology program is based on a combination of criteria including: adequacy of preparation in the behavioral sciences, excellence of undergraduate academic performance, scores on the Graduate Record Examination, and a history of involvement and successful performance in professionally relevant activities.

It is not possible to accept all applicants who meet the minimal requirements for any of the above programs because admissions to graduate study in psychology are limited in number.

A wide variety of assistantships, traineeships, and fellowships is available for students in the Ph.D. and D.Psych. programs.

Master of Arts. The Master of Arts is awarded to candidates who complete satisfactorily eight units of work, including an acceptable thesis. The Doctor of Philosophy is awarded to candidates who go on to complete an approved program in their area of specialization and meet Graduate College requirements for the degree.

Master of Science. The Master of Science is awarded to candidates who complete satisfactorily eight units of work after completing an applied psychology undergraduate major at the University of Illinois.

Doctor of Psychology. The Doctor of Psychology is awarded in clinical and counseling psychology when the following requirements have been completed: three years of full-time course work consisting of twenty-four to twenty-eight units, of which twenty units must be at the 400 level, one summer session of orientation in a hospital or clinic and one summer session of practicum in a hospital or clinic, a preliminary examination administered by a committee appointed by the Dean of the Graduate College, one year of internship following the third year of course work, a report on the year of internship (not a dissertation), and a final examination administered by a committee appointed by the Dean of the Graduate College.

RADIO AND TELEVISION

Head of the Department: P. E. Welch
Correspondence and Information: Department of Radio and Television, University of Illinois, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professor: P. E. Welch
Assistant Professors: J. E. Cramer, E. F. Douglass, D. P. Mullally

Graduate Program. The Department of Radio and Television offers work leading to the Master of Science in Radio and Television. For the program leading to the Doctor of Philosophy in Communications, see page 57.

Admission. Admission to the program leading to the Master of Science requires

completion of the requirements for a bachelor's degree in an institution of recognized standing, preferably with a major in radio-television or a related field, or the social sciences, and an admission average of at least 4.0. Applications of students with averages below 4.0 but above 3.5 are considered on an individual basis. However, because applications for admissions usually far exceed capacity, in recent years undergraduate averages of most students admitted have been well above the 4.0 minimum.

Master of Science. Requirements for the degree of Master of Science in Radio and Television include the following: a major of four units or three units and one additional unit approved by the adviser, a minor of at least two units, normally in an area outside the College of Communications, a one-unit thesis or approved production project, a minimum of three units in courses (including thesis) at the 400 level, at least two of which must be in the major field, and a minimum of eight units.

RECREATION AND PARK ADMINISTRATION

Head of the Department: A. V. Sapora
Coordinator of Curriculum and Instruction: George Lowrey, Jr.
Correspondence and Information: A. V. Sapora, Head, Department of Recreation and Park Administration, University of Illinois, 104 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professor: A. V. Sapora
Associate Professor: H. E. Weaver
Assistant Professors: J. J. Bannon, D. W. Bishop, M. J. Ellis, A. F. Gramza, G. A. Lowrey, Jr., R. Martens, M. G. Wade

Graduate Programs. The Department of Recreation and Park Administration offers programs of study leading to the Master of Science in Recreation and the Doctor of Philosophy in Physical Education with specialization in Recreation. The Master of Science program may either prepare supervisors and administrators for public parks and recreation systems, treatment centers for the ill and handicapped, and various private and semipublic settings providing leisure services, or be the first step toward the Ph.D. program. The Ph.D. program is, in general, designed to train teacher-scholars and research personnel in the study of leisure behavior or the management of leisure service delivery systems or both.

Admission and Aid. The departmental Graduate Selection Committee strives to select those students with maturity and experience who show real promise of being academically and professionally productive. The previous degree field is of importance and preference is given to those with a solid array of undergraduate courses in recreation or a master's degree in the field. Preference is also given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students either as fellowships, teaching or research assistantships, and tuition and fee waivers.

Individuals who wish to be considered for the M.S. program must present an admission average of at least 3.5, thirty semester hours of approved undergraduate credit in recreation or closely allied fields, fifteen semester hours in the social and psychological sciences, eight semester hours in the natural sciences, a course in statistics or tests and measurements, and successful field experience

or credit field work. Students whose undergraduate training is deficient in one or more areas may be admitted with deficiencies to be removed during the first year of graduate study.

Those seeking admission to the Ph.D. program must have an admission average of 4.0 for the last sixty hours of undergraduate work and previous graduate study, satisfactory scores on both the Miller Analogies Test and the Graduate Record Examination, and successful experience in the field. Candidates are required to have a personal interview with the head of the department or his representative. Students in the department wishing to continue beyond the master's must apply formally and will be considered in competition with applicants who are taking the master's degree elsewhere.

Master of Science. A candidate for the M.S. in Recreation and Park Administration must spend at least two semesters in residence. He is required to complete at least eight units, three of which must be in the 400 series. Four of these units should be in the area of specialization. A thesis may be written for two units. Those waiving the thesis are required to take and pass a final comprehensive written examination. A full-time student may complete this program in one calendar year.

Doctor of Philosophy. Candidates for the Ph.D. must complete satisfactorily sixteen units beyond the master's. These units include the Ph.D. dissertation. Two languages are required but may be waived provided two additional units of course work are substituted for each language. Graduate examinations include written preliminary examinations taken at the completion of formal course work, oral preliminary examinations on proposed research of the thesis, and a final examination in defense of the doctoral thesis. The residence requirement is two years.

ROMANCE LINGUISTICS

Graduate Programs. A concentration in Romance linguistics is available to candidates for the Doctor of Philosophy in French, in Linguistics, or in Spanish. The curriculum is based upon appropriate course offerings in the three departments; further information may be obtained from the heads of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: R. T. Fisher Jr.
Correspondence and Information: Director of the Russian and East European Center, University of Illinois, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: C. L. Dawson, E. J. DeMaris, F. Dovring, J. D. Fellmann, R. T. Fisher Jr., J. Gorecki, F. M. Gottheil, K. A. Hitchins, D. R. Hodgman, E. G. Lewis, P. B. Maggs, L. H. Miller, J. A. Nichols, T. Pachmuss, P. W. Schroeder, D. B. Shimkin
Associate Professors: E. C. Bristol, R. Dunatov, F. Y. Gladney, S. P. Hill, K. Klein, J. P. McKay, J. R. Millar, R. F. Miller, B. P. Uroff
Assistant Professors: M. A. Curran, D. L. Ransel, M. Shorish

Graduate Programs. Graduate programs in Russian language and area studies

are offered by the Russian and East European Center in cooperation with various departments.

Minor for the Master's Degree. A candidate for the master's degree who elects Russian language and area studies as a minor must earn at least two units of graduate credit in courses chosen from the following: anthropology, economics, geography, history, law, library science, political science, Russian, and sociology. The courses chosen must be in at least two departments.

Minor for the Doctor of Philosophy. A doctoral candidate who elects Russian language and area studies as a minor must demonstrate a reading command of Russian as tested by examination or by completion, with a grade of A or B, of specified courses in the Russian language, and in addition must earn at least four units of graduate credit in courses chosen from the list given just above. The four units must include courses from at least two departments outside of, and may at the same time include up to one unit from within, the department offering the candidate's major.

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is awarded by the Graduate College and the Russian and East European Center. It is for persons with the baccalaureate who are enrolled in advanced studies in any discipline and who wish at the same time to gain a knowledge of the Russian area and language. The requirements are: (1) A good command of written and spoken Russian, as determined by special examinations, or a grade of A or B in specified courses in the Russian language. (2) At least six graduate units relating to Russia, distributed among at least three of the departments represented in the program (anthropology, economics, geography, history, law, library science, political science, Russian, and sociology) other than the student's own major department. If the student's major department is one of these nine he may count, as part of his six units, up to one unit from within his major department. (3) A special essay based largely on Russian sources, which must meet, at the minimum, the standard normally required in a master's thesis. The student may submit, in fulfillment of this requirement, a copy of his master's thesis or doctoral dissertation.

SLAVIC LANGUAGES AND LITERATURES

(Including Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Slavic, and Ukrainian)

Head of the Department: C. L. Dawson
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois, 3092 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: C. L. Dawson, T. Pachmuss
Associate Professors: E. Bristol, R. Dunatov, F. Y. Gladney, S. P. Hill, K. Klein
Assistant Professors: M. A. Curran, M. Kenstowicz

Graduate Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the Master of Arts in Russian, Master of Arts in the Teaching of Russian, and Doctor of Philosophy in Russian literature or Slavic linguistics.

Admission. Students with an admission average of 4.0 or above are regularly

admitted to graduate courses, subject to fulfillment of other prerequisites. Students with a grade-point average between 3.75 and 4.0 may be admitted upon approval of the department, subject to quota limitations.

Students electing Russian as a major subject should have had the equivalent of at least four years of Russian in college, including practical work in the use of the language and some advanced course work in Russian literature.

Students choosing Russian as a minor subject should consult the department.

Master of Arts in Russian. In addition to fulfilling the general requirements of the Graduate College, candidates must pass both a written and an oral examination. Students may major in literature or linguistics. Students majoring in literature must present at least two courses in linguistics; those majoring in linguistics must present at least two courses in literature.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take: (1) Russian, five units, including at least two units from courses open only to graduates. (2) Education, two units, including one unit in educational psychology and one unit in history and philosophy of education. (3) Electives, one unit. These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 27, requirements for teacher certification.

Doctor of Philosophy. All candidates for the Ph.D. must fulfill the general requirements of the Graduate College and must have a reading knowledge of French and German. A student may choose literature or linguistics for his major field. He must also present a minor consisting of three graduate-level courses in a single field or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature, or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another Slavic language or literature in the original or both. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other Slavic languages or literatures in the original or both.

Graduate courses are offered in the following Slavic languages: Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, and Ukrainian.

SOCIAL SCIENCES

Correspondence and Information: Harry M. Johnson, Director of the Program, Master of Arts in the Social Sciences, University of Illinois, 326 Lincoln Hall, Urbana, Illinois 61801

Master of Arts in the Social Sciences. A special program leading to the Master of Arts in the Social Sciences is offered to students through the Division of Social Sciences (including anthropology, economics, geography, history, philosophy, politcal science, psychology, social work, and sociology). This program is designed to meet the needs of students who plan to teach the social sciences and the needs of those who wish to study in several related fields within the social sciences rather than to specialize in one department. To qualify for this program a student must have an admission average of at least 4.0. Applications of students with averages below 4.0 but above 3.75 are considered on an individual basis.

The Master of Arts in the Social Sciences requires a major of four units and a minor or double minor totaling four units. No minor may be less than two units. At least three of the eight units required for this degree must be

in 400-level courses, with at least two of these three units in the major. The students work is directly supervised by an advisory committee, composed of two or three members, one for each field of study forming a major or minor. The representative of the major field is the chairman of the committee. As part of his work in the major field, each student is required to write an essay under the direction of the chairman of the committee and subject to his approval. Work upon this essay may constitute, through registration in research courses, part of the four units of work required for the major. At the completion of his studies the student must pass an oral comprehensive examination given by the committee as a whole.

Correspondence and Information: J. R. Dahl, Director of the Program, Master of Arts in the Teaching of Social Studies, University of Illinois, 300c Gregory Hall, Urbana, Illinois 61801

Master of Arts in the Teaching of Social Studies. Candidates for this degree who hold secondary school social studies certificates may complete requirements with eight units of graduate work. Four units are to be in the social studies (two of these must be in history); three units are in educational psychology, history and philosophy of education, and secondary and continuing education; and one unit is an elective chosen in consultation with the adviser.

Potential candidates who are not certified must consult with the director of the Master of Arts in the Teaching of Social Studies program.

The required admission average is 3.75. Applications of students with averages below 3.75 but above 3.5 are considered on an individual basis.

SOCIAL WORK

Director of the Jane Addams Graduate School of Social Work: Mark P. Hale
Assistant Director: Charles H. Henderson
Correspondence and Information: Director, Jane Addams Graduate School of Social Work, University of Illinois, 1207 West Oregon Street, Urbana, Illinois 61801

FACULTY

Professors: D. Brieland, L. B. Costin, M. P. Hale, F. H. Itzin, M. Taber
Associate Professors: R. J. Anderson, C. H. Henderson, M. Monkman, A. J. Vattano, R. Weagant
Assistant Professors: C. R. Atherton, S. M. Clay, R. A. Downing, G. L. Euster, K. Gould, E. N. Gullerud, E. Handler, B-L. Kim, P. L. Leuenberger, I. Vargus, S. H. Wattenberg

Graduate Program. The Jane Addams Graduate School of Social Work offers a complete program leading to the Master of Social Work. Similar programs are offered on both the Chicago Circle campus and the Urbana-Champaign campus of the University. Social work career concentrations are provided in: social and direct treatment which include casework and group work; community organization and planning; and social policy and administration. The curriculum may be completed in sixteen months of continuous full-time study on the Urbana-Champaign campus. Field instruction is conducted through social agencies located in Urbana-Champaign, Decatur, Danville, Peoria, and Springfield, and by special arrangements in selected other communities.

Admission and Aid. To be considered for admission, a student must have com-

pleted a minimum of twenty hours in social science courses. The student must show evidence of physical capacity to complete a study program which taxes physical energy, emotional maturity commensurate with his age and past experience, interest in and liking for people, an ability to establish effective and healthful relationships, and personal integrity as demonstrated by intellectual honesty and a sense of responsibility. In addition, the applicant must have an admission average of not less than 3.5. Because applications for admissions usually have far exceeded capacity in recent years, the grade-point averages of students admitted have been well above the minimum. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees. A number of social agency stipends are also available.

SOCIOLOGY

Head of the Department: Frederick C. Fliegel
Associate Head and Graduate Admissions Officer: Sidney J. Kronus
Correspondence and Information: Sidney J. Kronus, Associate Head of the Department, Department of Sociology, University of Illinois, 326 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: D. J. Bordua, F. C. Fliegel, W. H. Form, J. Gorecki, N. G. Jacobs, H. M. Johnson, B. Karsh, R. J. Simon, S. Sudman
Associate Professors: H. M. Choldin, N. K. Denzin, K. W. Dickman, G. R. Lueschen, J. W. Robinson, J. L. Spaeth, N. Wiley
Assistant Professors: J. Huber, J. R. Kimberly, S. Kronus, W. E. Maxwell, S. C. McPhail, Jr., A. M. Orum, A. J. Sofranko, M. Solaun, K. E. Southwood, C. Uche, J. C. van Es, P. D. Wiebe, J. D. Woelfel, P. Wong

Graduate Programs. The Department of Sociology offers graduate work leading to the Master of Arts and Doctor of Philosophy. The Master of Arts program is, in general, designed as a first step toward the doctorate. Considerable specialization is possible in the Ph.D. program, with a general emphasis on preparation for a career in research and teaching at the college and university level.

Admission. Students applying for admission should have a strong undergraduate background in one of the social sciences, preferably sociology. Prior training in logic, philosophy of science, mathematics, and statistics is given special attention in considering applicants. Applicants must submit Graduate Record Examination scores on the tests of verbal ability and quantitative ability and on the advanced test in sociology. An admission average of 4.0 is required, although otherwise exceptional students are occasionally admitted with somewhat lower average grades.

Master of Arts. A candidate for the A.M. in Sociology must earn ten units of graduate credit, including one advanced course in research methods and one advanced course in statistics.

Doctor of Philosophy. Candidates for the Ph.D. must satisfactorily complete two advanced courses in statistics and at least one advanced course in research methods. Comprehensive examinations, either written or oral, are required in sociological theory, research methods, the student's area of specialization, and in three supplementary substantive areas. Information on additional requirements is given in the departmental manual for graduate students.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan and Rumanian)

Head of the Department: A. M. Pasquariello
Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois, 4080 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. H. D. Allen, J. S. Flores, M. H. Forster, L Leal, R. E. Lott, R. Montano, A. M. Pasquariello, A. R. Pietrangeli, A. Porqueras-Mayo
Associate Professors: S. W. Baldwin, Jr., W. C. Blaylock, H. W. Cowes, D. R. Hershberg, T. C. Meehan, R. A. Preto-Rodas, M. D. Saltarelli
Assistant Professors: A. Aiex, A. Cassell, M. Francescato, D. Wanner

Graduate Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy in Spanish, Italian, or Portuguese, and to a Master of Arts in the Teaching of Spanish. Fields of concentration are Spanish linguistics; Romance linguistics; Spanish literature; Latin American literature; Italian literature; and Portuguese literature. Graduate courses in Catalan and Rumanian are available.

Admission. The departmental requirement is an admission average of at least 4.0. Applications of students with grade-point averages below 4.0 but above 3.75 are considered on an individual basis. Prerequisite for a graduate major is an undergraduate major in one Romance language or Latin, or consent of the department. Prerequisite for a minor is consent of the department.

Students doing graduate work for any advanced degree in Spanish must possess or acquire a practical command of the language. For the Doctor of Philosophy, some knowledge of Italian or Portuguese is required. Parallel training in one or more other languages or literatures, such as English, French, German, Greek, Italian, Latin, and Portuguese, is desirable.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and on a general reading list. Three areas of specialization are offered: Spanish or Spanish-American literature, Spanish linguistics, and the teaching of Spanish. Detailed statements of the course requirements for each specialization may be obtained from the department.

Doctor of Philosophy. Students working toward the Doctor of Philosophy are admitted with provisional departmental status until their performance in graduate work is judged acceptable for full departmental status by the department's graduate committee. A comprehensive written examination is used as a basis for this judgment. Candidates are required to present evidence of a reading knowledge of French and of one other language to be selected in consultation with the adviser, and are expected to take at least two units in seminar courses.

Four areas of specialization are available: Renaissance and golden age, Spanish literature of the nineteenth and twentieth centuries, Latin American literature and Spanish linguistics. For the specialization in Spanish linguistics, general linguistics is a required minor; the department should be consulted on the selection of minors for the other specializations.

Italian and Portuguese

Candidates for an advanced degree in Italian or Portuguese should consult the department. Provisions are made to fit individual cases.

SPEECH

Head of the Department: Roger Nebergall
Director of Graduate Study: Kenneth Andersen
Correspondence and Information: Director of Graduate Study, Department of Speech, University of Illinois, 247 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: M. H. Arbenz, J. J. Bateman, C. M. Behringer, K. W. Broadrick, K. Burns, A. J. Derbyshire, B. W. Hewitt, H. L. Mueller, R. E. Nebergall, M. H. Nichols, J. J. O'Neill, J. W. Scott, C. H. Shattuck, W. R. Zemlin
Associate Professors: J C. Ahart, K. E. Andersen, N. W. Hunter, R. L. Ince, F. L. Johnson, M. E. Joseph, C. W. Kim, J. Maclay, E. P. Paden, L. J. Sanders, R. K. Simpson, E. W. Stark, B. R. Works
Assistant Professors: P. B. Arlt, R. A. Clark, J. G. Delia, W. DeMarco, M. V. Doyle, E. D. Eilbracht, J. G. Erickson, P. Franklin-White, R. G. Johnston, D. Llewellyn, J. L. Locke, F. L. Nasca, S. H. Thomas, R. E. Tymchyshyn, J. W. Wenzel

Graduate Programs. The Department of Speech offers courses leading to the Master of Arts, Master of Science, and Doctor of Philosophy.

Admission and Aid. The Graduate Record Examinations, verbal and quantitative, and an admission average of at least 4.0, are required in all curricula except speech and hearing science. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. For the degree of Master of Arts, students may concentrate in one of these areas: rhetorical and communication theory; interpretation; and speech and hearing science. They may also select a special curriculum in the teaching of speech. The entering student should present the equivalent of sixteen hours of undergraduate work in speech, communications, interpretation, or speech and hearing science. In addition to meeting general regulations of the Graduate College, a final written examination is required of all candidates. In some cases an oral examination is also stipulated. A thesis is optional. Students wishing to concentrate in theatre should apply to the Department of Theatre.

Master of Arts in Teaching. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College requirements and department requirements including the comprehensive examination, M.A.T. candidates must complete six units of work in the department plus the units of required work in education. See page 27.

Master of Science in Speech and Hearing Science. Graduation from a four-year preprofessional degree program (undergraduate) or its equivalent is a prerequisite for admission. Requirements include six units of work in speech and hearing science, the units of required work in education (see page 27) and, if not completed, student teaching. A precise statement of the degree requirements may be obtained upon request.

Doctor of Philosophy. For the Doctor of Philosophy, students may exercise one of five options: rhetoric and communication theory; theatre; speech and hearing science; experimental phonetics; and interpretation. Students are accepted as candidates for the doctor's degree who present either a well-rounded undergraduate education with at least sixteen hours of credit in speech or who hold a master's degree in speech or theatre from an accredited institution.

THEATRE

Chairman of the Department: Barnard Hewitt
Correspondence and Information: Chairman of the Department of Theatre, University of Illinois, 4-122 Krannert Center for the Performing Arts, Urbana, Illinois 61801

FACULTY

Professors: M. H. Arbenz, C. M. Behringer, B. Hewitt, J. W. Scott, C. H. Shattuck
Associate Professors: J. C. Ahart, B. R. Works
Assistant Professors: P. Franklin-White, D. Llewellyn, S. Murray, R. Tymchyshyn

Graduate Programs. The Department of Theatre offers graduate work leading to the Master of Arts in Theatre and, in cooperation with the Department of Speech, the Doctor of Philosophy in Speech with a theatre option.

Admission and Aid. Applicants will be considered who have an admission average of at least 3.5 and either an undergraduate major in theatre, which includes at least nine hours in dramatic literature as part of the major or in addition to the major, or any undergraduate major which includes at least nine hours of basic courses in theatre (acting, directing, production) and seven hours in speech or dramatic literature. Applicants will be considered for admission to the program leading to the degree of Doctor of Philosophy in Speech with a theatre option who have at least a 4.0 average in the last four semesters of graduate and undergraduate work, and a Master of Arts or a Master of Fine Arts in Theatre, or the equivalent. Teaching and production assistantships, fellowships, and waivers of tuition and fees are available in limited numbers.

Master of Arts. A candidate for the A.M. must spend at least two semesters or the equivalent in residence. He must complete at least eight units of course work in theatre and related studies, including at least two units in history and theory of theatre and two in applied theatre, and he must pass a final comprehensive examination. Neither a foreign language nor a thesis is required. A full-time student can complete this program in one academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's must apply formally and will be considered in competition with applicants who present a master's from elsewhere. Requirements for the degree are a minimum of eight units in courses in theatre and related studies beyond the master's, a reading knowledge of two foreign languages, or of one foreign language and one of the prescribed substitutes, and a minimum of eight units of dissertation research. The student must pass a comprehensive written and oral examination after he has fulfilled his course and language requirements, and he must defend his dissertation orally before a committee of the graduate faculty. The program ordinarily requires two or three years beyond the master's.

THEORETICAL AND APPLIED MECHANICS

Head of the Department: Richard T. Shield
Graduate Program Coordinator: Robert E. Miller
Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois, 212 Talbot Laboratory, Urbana, Illinois 61801

FACULTY

Professors: A. P. Boresi, C. E. Bowman, D. E. Carlson, M. E. Clark, H. T. Corten, G. A. Costello, T J. Dolan, R. A. Eubanks, P. G. Jones, C. E. Kesler, H. L. Langhaar, R. E. Miller, J. Morrow, J. M. Robertson, R. T. Shield, O. M. Sidebottom, G. M. Sinclair, M. C. Stippes, C. E. Taylor, H. R. Wetenkamp, W. J. Worley
Associate Professors: A. C. Bianchini, T. M. Elsesser, J. W. Murdock
Assistant Professors: F. G. Bauling, R. S. Jensen, P. V. McLaughlin, J. W. Phillips, J. S. Walker, J. C. Wiley

Graduate Programs. The Department of Theoretical and Applied Mechanics offers a full course of study leading to the Master of Science and Doctor of Philosophy. Students may specialize in such areas as elasticity; plasticity; elastic stability; wave propagation; dynamics and vibrations; photoelasticity; fatigue of metals; crack propagation; ideal or viscous fluid flow; magnetohydrodynamics; biomechanics; and shell theory. A major in applied mathematics is also available. See page 97.

Admissions and Aid. Students admitted for graduate work in Theoretical and Applied Mechanics usually have a bachelor's or master's degree in engineering. However, students with majors in mathematics, physics, computer science, and similar areas may also be admitted. Admission with full standing requires a 4.0 admission average. Applicants with averages below 4.0 are considered on an individual basis. Financial aid is available to selected students in the form of research assistantships, teaching assistantships, fellowships, and waivers of tuition and fees.

Master of Science. Candidates are required to complete a minimum of eight units of graduate work, including a thesis (ordinarily two units). If a student does not wish to present a thesis, then nine units of course work are required. There is no language requirement. A full-time student can complete this program in one academic year of study. A student who has an assistantship normally completes the requirements in one calendar year.

Doctor of Philosophy. Candidates for the Doctor of Philosophy are required to complete eight units of course work beyond the master's degree, including at least one-half unit from each of the following major areas in the department: applied mathematics, dynamics and vibrations, fluid mechanics, materials engineering, and solid mechanics. There are no formal requirements for foreign languages or outside minors. A student must pass a written qualifying examination and an oral preliminary examination before commencing his dissertation. The thesis research normally comprises about half the work beyond the master's degree. A student can complete this program in two years' study beyond the master's degree.

URBAN AND REGIONAL PLANNING

Head of the Department: Michael P. Brooks
Correspondence and Information: Head of the Department of Urban and Regional Planning, University of Illinois, 909 West Nevada Street, Urbana, Illinois 61801

FACULTY

Professors: L. F. Blair, M. P. Brooks, E. C. Freund, W. I. Goodman, A. Z. Guttenberg, S. Keyes, L. B. Wetmore
Associate Professors: C. W. Forrest, J. A. Quinn
Assistant Professors: L. F. Heumann, C. V. Patton

Graduate Program. The Department of Urban and Regional Planning offers graduate work leading to the degree of Master of Urban Planning.

Admission and Aid. To be admitted, students must have an admission average of at least 3.75. While the social sciences, the design professions, civil engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities, the physical sciences, and other fields. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Urban Planning. The master's degree program is designed to prepare students for careers in planning. Such careers can involve service in public agencies at any of the several levels of government, in private consulting practice, or in other semipublic organizations in need of planning services. Alternatively, the program may prepare students for advanced work leading to the Ph.D. degree and a career in teaching or research or both. The program combines a set of minimum requirements with a high degree of flexibility and choice. The course of study ordinarily requires two years; a student with an undergraduate degree in urban planning, however, may be able to complete the program in a shorter period. First-year students typically follow a core program focusing on the basic elements of planning, including studies in planning theory, analytical methods, planning procedure, history, and administration. The second year provides opportunities for further work in areas of specialized interest. To qualify for the degree, a student must complete a minimum of eight units, of which at least six must be in urban and regional planning courses. At least three of the eight units must be at the 400 level, and two of these must be in urban and regional planning. Additional units will be required for candidates without sufficient background in planning.

VETERINARY MEDICAL SCIENCE

Head of the Department: L. Meyer Jones
Assistant Head: Kenneth W. Sloan
Correspondence and Information: Assistant Head, Department of Veterinary Medical Science, University of Illinois, 141 Veterinary Medicine Building, Urbana, Illinois 61801

FACULTY

Professors: P. D. Beamer, M. E. Bergeland, L. E. Boley, H. S. Bryan, A. J. Cawley, P. R. Fitzgerald, H. W. Hannah, L. E. Hanson, H. J. Hardenbrook, R. D. Hatch, L. C. Helper, W. G. Huber, L. M. Jones, N. D. Levine, D. R. Lingard, R. P. Link, J. E. Lovell, W. L. Myers, M. Ristic, L. E. St. Clair, A. G. Schiller, D. Segre, P. H. Silverman, J. Simon, E. Small, A. R. Twardock, A. M. Watrach, G. T. Woods

Associate Professors: J. D. Conroy, D. H. Ferris, A. H. Killinger, J. P. Manning, R. C. Meyer, W. M. Newton, H. A. Reynolds, H. E. Rhoades, F. E. Romack, A. H. Safanie, K. W. Sloan, J. C. Thurmon, K. S. Todd
Assistant Professors: G. L. Jackson, D. K. Normandin

Graduate Programs. The Department of Veterinary Medical Science offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Fields of specialized study in the department include the following: anatomy; clinical sciences; immunology; microbiology; parasitology; pathology; pharmacology; and physiology. Degree requirements are described in a brochure available from the department.

Admission and Aid. Applicants must have an admission average of 4.0. Those with an average between 3.75 and 4.0 may be admitted on limited status. The undergraduate program should include at least five semester hours of physics or mathematics, fourteen hours of chemistry, and fifteen hours of biological sciences. A student who is deficient in these subjects may be accepted but will be required to remove the deficiency during the first year of residence. Qualifications of students must be approved by the department's Committee on Admission of Graduate Students.

A limited number of teaching and research assistantships in the departments of the College of Veterinary Medicine are available.

Where to Write

ADMISSION

Graduate and Foreign Admissions
312 Metallurgy and Mining Building, Urbana 61801
or
The Graduate College
330 Administration Building, Urbana 61801

CHICAGO CIRCLE

The Graduate College
P.O. Box 4348, Chicago 60680

EMPLOYMENT (Hourly)

Director, Student Employment
Room 109, 707 South Sixth Street, Champaign 61820

EXTRAMURAL CLASSES

Division of University Extension
101 Illini Hall, Champaign 61820

FELLOWSHIPS, ASSISTANTSHIPS, OTHER FINANCIAL AID

The prospective major department

FOREIGN STUDENTS (Passport, Visa Assistance)

Director, Office of Foreign Student Affairs
310 Student Services Building, Champaign 61820

HOUSING

Director, Housing Division
420 Student Services Building, Champaign 61820

MEDICAL CENTER (Medical and Dental Sciences, Nursing, Pharmacy)

The Graduate College
P.O. Box 6998, Chicago 60680

MOTOR VEHICLE AND BICYCLE REGISTRATION

Motor Vehicle Registration Office
507 East Daniel Street, Champaign 61820

SERVICES FOR PERMANENTLY PHYSICALLY HANDICAPPED STUDENTS

Division of Rehabilitation-Education Services
Rehabilitation-Education Center, Champaign 61820

VETERANS

Veterans Educational Benefits
Room 109, 707 South Sixth Street, Champaign 61820

1974-76

Graduate Programs

University of Illinois at Urbana-Champaign

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1974-76
Graduate Programs

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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UNIVERSITY CALENDAR — URBANA-CHAMPAIGN CAMPUS

A Graduate College calendar giving important dates and deadlines for graduate students enrolled on campus may be obtained in 330 Administration Building.

Eight-Week Summer Session, 1974

June 10, Mon.-June 11, Tues.	Registration
June 12, Wed.	Instruction begins
July 4, Thurs.	Independence Day (all-campus holiday)
July 8, Mon.	Beginning of second four-week courses
Aug. 1, Thurs.	Last day of instruction
Aug. 2, Fri.-Aug. 3, Sat.	Summer session examinations

First Semester, 1974-75

Aug. 19, Mon.-Aug. 25, Sun.	New Student Week
Aug. 21, Wed.-Aug. 23, Fri.	Registration
Aug. 26, Mon.	Instruction begins
Sept. 2, Mon.	Labor Day (all-campus holiday) (no classes)
Nov. 11, Mon.	Veterans Day observance (classes dismissed 10:45 to 11:15 a.m.)
Nov. 26, Tues.-Dec. 2, Mon., 7:00 a.m.	Thanksgiving holiday (no classes)
Dec. 12, Thurs.	Last day of instruction
Dec. 13, Fri.	Reading day
Dec. 14, Sat.-Dec. 21, Sat.	Semester examinations
Dec. 25, Wed.	Christmas (all-campus holiday)
Jan. 1, Wed.	New Year's Day (all-campus holiday)

Second Semester, 1974-75

Jan. 13, Mon.-Jan. 19, Sun.	New Student Week
Jan. 15, Wed.-Jan. 17, Fri.	Registration
Jan. 20, Mon.	Instruction begins
Mar. 22, Sat., 1:00 p.m.	Spring vacation begins
Mar. 28, Fri.	Good Friday (all-campus holiday)
Mar. 31, Mon., 7:00 a.m.	Spring vacation ends
May 8, Thurs.	Last day of instruction
May 9, Fri.	Reading day
May 10, Sat.-May 17, Sat.	Semester examinations
May 18, Sun.	Commencement exercises

The Graduate College

The University of Illinois was founded in 1867 at Urbana as the land-grant institution of the state of Illinois. At present the University consists of three campuses: the Medical Center and Chicago Circle in Chicago, and the original campus 130 miles south of Chicago in Urbana-Champaign, a community of 100,000 people.

The Graduate College enrollment at the Urbana-Champaign campus is about 8,000 students out of a total campus enrollment of 34,000 students from all fifty states and most of the countries of the world. The information on these pages relates to this campus only, although there are numerous opportunities for developing interdisciplinary, intercampus programs of graduate study that combine the facilities and resources of all three campuses and those foreign countries where the University of Illinois maintains contracts. The large graduate faculty; a library of over six million items including music scores, recordings, microtexts, and maps; and numerous social and cultural activities make the University of Illinois at Urbana-Champaign an especially stimulating environment for graduate study.

UNIVERSITY RESOURCES AND FACILITIES

Libraries

The University Library's resources for advanced study and research are outstanding. Its present collections now exceed five million volumes. In addition to these cataloged volumes, the University Library at Urbana-Champaign contains approximately 536,000 pamphlets, 410,000 maps and aerial photographs, 385,000 music scores and parts, and 500,000 microtexts. The Library receives more than 77,000 periodicals, serials, and newspapers.

Outstanding collections have been developed for a variety of fields. In the humanities, strong areas include classical literature, history, and archaeology; English literature of the sixteenth through the twentieth centuries; Romance and Slavic literature; German literature of the sixteenth and seventeenth centuries; American humor and folklore; and comparative philology. In the fine arts collections in architecture, landscape architecture, and music are noteworthy.

Holdings in the social sciences include significant collections in history of the western United States, Abraham Lincoln and the Civil War, Latin America of the revolutionary period, medieval and modern Europe, Ireland, and the Slavic countries. Also noteworthy are collections in international law and relations, political science, law, economics, labor and industrial relations, and education.

Strong areas in science and technology include mathematics, chemistry, biological sciences (especially parasitology, entomology, and ornithology), physics, geology, engineering, and agriculture.

Many of these collections are housed in the Rare Book Room. Notable strengths in that room lie in Milton's works and Miltoniana (including the best collection extant of seventeenth-century editions); religious and educational texts influencing Milton, Shakespeare, and their contemporaries; emblem books of Germany and the low countries; British historical, economic, and literary works of the eighteenth century; H. G. Wells's correspondence and works; and original and early editions of sources in the history of geology.

The Library's bibliographical facilities comprise a general catalog of more than seven million cards, printed catalogs of libraries, e.g., the Bibliothèque Nationale, British Museum, and Library of Congress; national and trade bibliographies of all countries for which such works have been issued; bibliographies of special subjects; and similar aids.

A number of departmental and college libraries are maintained. The main Library houses the following principal collections: Classics, Commerce, Education and Social Science, English, History and Philosophy, Human Relations Area Files, Illinois Historical Survey, Library Science, Map and Geography, Modern Language, Newspaper, Physical Education, Rare Book Room, Special Languages, and University Archives.

Elsewhere on the campus are the following departmental libraries: agriculture, architecture and fine arts, biology, chemistry, city planning and landscape architecture, communications, engineering, geology, home economics, labor and industrial relations, law, mathematics, music, natural History Survey (entomology and other biological sciences), physics, veterinary medicine, and the Undergraduate Library.

Further facilities available for graduate students are the general bookstacks, housing about 3,500,000 volumes, and over 400 carrels in the bookstacks, assigned to individuals engaged in extended study and research. Interlibrary loan service is provided for those engaged in research for dissertations.

Interdisciplinary and Multidisciplinary Academic Units

Children's Research Center. The Children's Research Center contains laboratories specializing in research on children in such areas as psychophysiology, motor performance and play research, attention and memory, speech development, day care, infant attention and learning, psychopharmacology, and learning disabilities. In addition, two normal nursery school classes and one day care class are conducted in the building, and the children are available for participation in research. Satellite facilities for research with children, operated by the center, are located in neighboring public schools and state institutions. Several trailer laboratories are used by the staff in conducting research on the site at public schools.

Situated on the south edge of the campus, the Children's Research Center shares a site with the Adler Zone Center operated by the State of Illinois Department of Mental Health. Patients from the Adler Center, which serves an eighteen-county area in east central Illinois, often participate in research projects conducted at the Children's Research Center.

Computer-based Education Research Laboratory (CERL). CERL has designed and is operating PLATO IV, a flexible and sophisticated computer-based education (CBE) system. The system uses a Control Data Corporation Cyber-73 computer as the central control unit for hundreds of student terminals; all student terminals can be used independently and simultaneously. In addition to terminals at CERL, PLATO classrooms have been set up throughout the Urbana campus of the University of Illinois and at the two Chicago campuses. Other PLATO terminals are located in several dozen institutions of higher learning in the United States and Canada and in about a dozen governmental or industrial locations. Instructional material is being prepared in over ninety academic disciplines for use by students ranging from kindergarten through graduate and professional programs and for adult education. Approximately 300 terminals were attached to the PLATO IV system in Urbana by the end of 1973. Several times that number will be added in the next couple of years.

Center for Advanced Computation. The Center for Advanced Computation conducts applied research and provides services to the academic community and state and federal governments. The center promotes interdisciplinary and applied research, and supports the development of computer technology which will contribute to the solution of problems of importance to society. A principal activity of the center is the development of numerical techniques and software systems for calculations in the social, life, and physical sciences.

The staff of the center consists of professionals, graduate research assistants, and academic personnel having joint appointments with academic departments including computer science, engineering, psychology, urban and regional planning, labor and industrial relations, economics, agricultural economics, business administration, and life sciences. Center staff with joint appointments may teach courses in their academic departments and supervise graduate theses supported by center contract funds. There are research activities in numerical analysis, mathematical programming, information systems, economic modeling, land use/transportation planning, computer languages and operating systems, and graphics systems. Interdepartmental graduate research and educational activities are being developed around the research efforts, methodologies, and systems developed at the center.

The center has a large variety of computational resources, including the ILLIAC IV system, via the Advanced Research Projects Agency (ARPA) Network. This highly reliable network links many of this country's major computer research laboratories and facilities through high-speed telephone lines. The center provides the education, documentation, consultation, and hardware and software development necessary for University of Illinois research faculty to effectively use the center and ARPA Network facilities in collaboration with center staff.

Coordinated Science Laboratory. The Coordinated Science Laboratory is organized to provide an interdisciplinary research environment to stimulate interaction among faculty and students from engineering sciences as well as other areas. The laboratory contributes to the graduate instructional program of the University by providing research facilities for graduate students in all of its programs.

Faculty members typically hold joint appointments in the Coordinated Science Laboratory where they conduct their research and supervise the research of graduate students, and in an academic department where they teach. Graduate students conducting thesis research in the laboratory earn their advanced degrees in the departments in which they are enrolled. There are research activities in

plasma physics, surface science, semiconductor devices, thin film devices, information theory and coding, systems theory, communication systems, switching theory and automatic fault diagnosis, artificial intelligence, high-density memories, plasma displays, man-machine interaction and retrieval, urban modeling development, optical information processing, and computational gas and fluid dynamics.

In addition to the usual supporting services, the laboratory maintains unique facilities in materials processing, including photochemical etching, electron beam welding, inert gas brazing, chemical plating, and glassblowing. Present computational facilities within the laboratory include a hybrid system consisting of a Control Data Corporation 1700 digital computer and an EAI-680 analog computer, and a Digital Equipment Corporation (DEC) System 10 which is used for time-sharing and real-time applications.

Laboratory for Atmospheric Research. The Laboratory for Atmospheric Research provides an opportunity for students majoring in engineering and the physical sciences to specialize in atmospheric science and to undertake thesis research in any of the following subjects: numerical weather prediction; numerical modeling of atmospheric systems; dynamics of tropical circulations; atmospheric turbulence; planetary boundary layers; atmospheric wave dynamics, upper atmosphere dynamics; planetary atmospheres; microphysical processes in clouds; and hydrometeorology. The graduate program in atmospheric science is taught by faculty members doing research in the Laboratory for Atmospheric Research. See page 50 for degree program in atmospheric sciences. The instructional activities and the facilities of this laboratory also are of interest to students specializing in ecology, bioclimatology, geography, environmental health, and related fields.

Research facilities available in the laboratory include access to the unique computing facilities of the National Center for Atmospheric Research located in Boulder, Colorado.

Materials Research Laboratory. The Materials Research Laboratory supports the training of graduate students and research in the materials sciences in cooperation with the departments of ceramic engineering, chemistry, chemical engineering, electrical engineering, geology, metallurgy and mining engineering, and physics. Emphasis is placed on interdisciplinary research which is basic to an understanding of the solid state of matter. The laboratory contains machine shops, cryogenic facilities, high temperature, toxic materials, x-ray, electron microscope and electron microprobe laboratories, a chemical analysis laboratory with emission and mass spectrographic equipment, and a 3 MEV electron accelerator.

Special Laboratory or Research Facilities

Center for Electron Microscopy. Located in the basement of Bevier Hall, the center is one of the largest user-oriented facilities in the world. A diversity of instrumentation is available to University faculty, staff, and graduate students. Rather than being a laboratory for electron optics research, it is designed to serve the varied research needs of the University community and in addition undertakes an extensive training program.

In its inventory of transmission electron microscopes are included routine performance instruments (RCA EMU 3C, 3E, and 3H) and conventional high-resolution microscopes (Siemens Elmiskop 1, Hitachi HU-11 and 11C, and JEOL JEM-6A). For those requiring the highest resolving power, the center offers the JEOL JEM-100C, a state-of-the-art 100kV microscope with a lattice resolvancy of 1.4 Ångstroms. The center provides two high quality scanning electron microscopes: the Kent-Cambridge Stereoscan, fully equipped with a nondispersive x-ray analyzer having multimode output; and the JEOL JSM-U3, one of the finest of the class utilizing a thermionic emitter. It will also soon be equipped with one of the most versatile electron microprobes available, the JEOL JXA-50A.

Ancillary equipment available to all users includes various ultramicrotomes, automatic knifebreakers, a pyramid cutter, several vacuum evaporators, a tissue drier, and a critical point drying device. For special techniques one ultramicrotome is equipped with a cryogenic sectioning kit; and one vacuum evaporator is equipped with an electron gun for vapor deposition of refractory materials and stages for freeze-etch and freeze-fracture work. Several completely equipped darkrooms and general specimen preparation facilities are also available.

The center's training program is the largest in the nation and is one of the few which offers full training in scanning electron microscopy. Graduate courses are offered in both the transmission and scanning modes. Both the theoretical and practical aspects of electron microscopy are stressed so that students with no prior knowledge of electron microscope operation, specimen preparation, or photography are, after one semester's study, able to apply the tool to their research problems. An intensive training program is also offered during the summer for faculty and staff wishing to acquire the skills requisite to high quality transmission electron microscopy.

Computing Services Office. Campuswide computing facilities for instruction and research activities of students and faculty are provided by the Computing Services Office. The central facility, located in the Digi-

tal Computer Laboratory, is an IBM System/360-75 with three million bytes of core storage which processes an average of 50,000 jobs per month. The facility provides consulting, keypunching services, and assistance in statistical applications for computer center users. Eight terminals located throughout the campus provide convenient job entry stations. One terminal located in the Commerce Building (West) also provides keypunching, consulting, and assistance in the use of the computer for numerical and statistical analysis, with special orientation to the needs of the social sciences. Computer facilities are available around the clock and are used by students and staff in such diverse fields as fine and applied arts, engineering, law, agriculture, journalism, education, psychology, chemistry, and civil engineering.

Laboratory for Ergonomics Research. The facilities of the Laboratory for Ergonomics Research, located in the Mechanical Engineering Laboratory, provide unique opportunities for pursuing interdisciplinary research on the interaction of man, his work, and his working environment. All departments and divisions of the University needing closely controlled environmental conditions for research or instructional work may utilize the special skills and equipment available in the laboratory. These include an altitude chamber which accommodates six human beings, permitting simulation of altitudes to 45,000 feet. Air temperature and humidity may be controlled in this chamber to permit investigations of the combined stresses of low environmental pressure and heat or cold. Additional controlled environmental rooms provide flexible areas where special test facilities may be installed. In addition the laboratory serves as the focus of teaching and research in the course sequence in ergonomics offered jointly by the departments of physiology and biophysics, mechanical and industrial engineering, and physical education.

Radioisotope Laboratory. The Radioisotope Laboratory is an all-University facility for graduate training and research involving the use of the tracer technique with hydrogen-2, hydrogen-3, carbon-13, and carbon-14. It is equipped with liquid scintillation spectrometers, vibrating reed electrometers, gas counters, radio-gas chromatography units, high vacuum systems, combustion setups, and auxiliary radiochemical equipment.

A prerequisite for research in the laboratory is the Chemistry-Biochemistry 496 course, which emphasizes experimental techniques employed in the synthesis, degradation, isolation, establishment of purity, and assay of radioactive chemistry compounds. Members of the staff present this course one semester each year.

Cultural Resources

Students at the University of Illinois have a wide choice of activities available to them. The *Daily Illini* regularly announces the selection, ranging from rock concerts to scholarly colloquia, and from experimental movies to major operatic productions. The five theatres in the Krannert Center for the Performing Arts, the Assembly Hall, and many other facilities present a continuous round of music, drama, dance, and cinema originating both locally and worldwide. Distinguished public figures are brought to campus for symposia, lecture series, forums, and public discussion. Faculty and students from around the globe provide the stimulation of the varying cultures of the world.

Three museums are open to the public. The World Heritage Museum houses a large collection of artifacts from prehistoric and historic cultures. The displays in the Natural History Museum are used to supplement material in the physical and biological science classes as well as to inform the public. In addition to displaying the University's permanent collection of art works, Krannert Art Museum mounts its own and traveling exhibitions.

Sports fans can look forward to exciting Big Ten competition, and those who enjoy participatory sports will find a complete range of facilities from handball courts to golf courses.

The Illini Union, the campus social center, offers lounges, dining facilities, and recreational and meeting rooms for students and professional conferences. Special events are scheduled throughout the year featuring foreign foods and cultural activities by student and faculty groups.

With the additional attraction of over a dozen movie theatres in the surrounding community, and the endless activities of the University-related and non-University organizations, social and cultural life at the University of Illinois is one of constant diversity and interest.

ADMISSION

General Requirements

The Graduate College considers for admission only those applicants who hold or will be granted at the end of the current academic year a baccalaureate or an equivalent degree comparable to that granted by the University of Illinois, and whose admission average is at least 3.5 on a scale of A=5.0. Admission averages are computed from the last sixty hours of undergraduate work and from any graduate work completed.

The final decision on admission, however, rests with the applicant's proposed major department, which may set a minimum grade-point average significantly higher than that of the Graduate College and which may impose other special admission requirements and conditions.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses which have a bearing on the student's field of specialization should submit; (a) a written evaluation or letter grade by the instructor in each such course and (b) scores on the Graduate Record Examination Aptitude Test. Applicants for graduate programs in accountancy and business administration should use the Admission Test for Graduate Study in Business instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible, preferably in the November or December before the fall term in which they wish to enroll, and as early as September or October if they plan to enter in January. Applications for admission in June should be submitted no later than May 15.

Admission forms may be obtained from the major department, the Graduate College, 330 Administration Building, or the Graduate and Foreign Admissions Office, 312 Mining and Metallurgy Building. A nonrefundable application fee of $20 must be submitted with the application. This fee is waived for members of the academic and nonacademic staff of the University and allied agencies.

Foreign students should apply several months before the registration period. The applicant must submit official records of all higher educational training, including certificates of degrees, with the dates the degrees were conferred. Eligible applicants whose native language is not English must also take the Test of English as a Foreign Language (TOEFL), given several times a year throughout the world. To make arrangements to take this test, applicants should write directly to the Educational Testing Service, Box 592, Princeton, New Jersey 08540, U.S.A.

Summer Session

In addition to a two-semester academic year, the Urbana-Champaign campus conducts an eight-week summer session for both degree and nondegree students. Students admitted with nondegree status in the summer must apply for readmission if they expect to register again in the fall, unless their status is changed to degree during the summer term.

Applicants who seek a degree, but who do not expect to register on the campus during the academic year, should indicate on the application that they expect to pursue campus course work only during summer sessions.

Opportunities for the Physically Handicapped

The Division of Rehabilitation-Education Services provides special facilities and services for students with permanent physical handicaps: paraplegics, triplegics, polios, spastics, deaf, blind, and others needing help. There are limitations on the total number of physically handicapped students that can be accepted, and preference is given to residents of Illinois, but properly qualified students from other states are considered.

Acceptance of physically handicapped students by the Office of Graduate and Foreign Admissions must be supported by joint approval of the McKinley Health Center and the Division of Rehabilitation-Education Services. Since the University may not be able to provide the necessary facilities for all who apply, early application for admission is essential.

Student Health Report Form

With the notice of acceptance of admission each student will receive a Student Health Report Form. If desired, this form can be used to report relevant medical data to the director of Health Services.

Some persons may be required by the director to present evidence of satisfactory physical and mental health, in which case admission or readmission may be denied until the student is cleared by the McKinley Health Center.

Tuberculosis Control

During the registration period each new, transfer, or readmitted student must take a tuberculin skin test and report to the McKinley Health Center for a reading within 48 to 72 hours after application, or present evidence of freedom from tuberculosis as evidenced by a University of Illinois or public health agency certificate (skin test or x-ray) dated within the last twelve months.

Persons who have a positive reading must have a chest x-ray taken by the McKinley Health Center. Persons with a history of positive reaction to tuberculin will not be skin tested but will be required to have a chest x-ray made by the health center. Health center x-rays are made without charge.

Failure to comply with the tuberculosis control requirements will result in cancellation of registration.

Residence Classification

The residence classification of an applicant is determined from information contained in the application for admission and other credentials. Tuition is assessed in accordance with this decision. Errors in residence classification or in assessments discovered following registration may result in adjustments of charges. A brochure, *Regulations Governing the Determination of Residency Status for Admission and Assessment of Student Tuition,* is available at the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 177 Administration Building, Urbana, Illinois 61801.

FINANCIAL AID

Financial assistance is available to promising students in all fields of study in the form of: (1) awards for which no services or repayments are required (fellowships and tuition and fee waivers), (2) teaching and research assistantships, (3) college work-study programs, and (4) loans. Any graduate student, present or potential, may apply to the University for financial aid in its several forms. Subject to the availability of funds, the following kinds of financial aid will be available.

Fellowships

University Fellowships. Students in all fields of graduate study are eligible to compete for approximately 200 University fellowships, which are awarded on the basis of academic and scholarly achievement. Applicants need not be citizens of the United States. University fellowships provide a stipend of at least $2,500 for nine months or $3,000 for eleven months, and an exemption from tuition and fees. A fellow must carry a full program of four units or the equivalent and may accept, if offered, an assistantship of no more than one-quarter time.

Graduate College fellowships are offered to students who show potential for success in graduate study, but who may have deficiencies in their undergraduate preparation. The fellowships are generally awarded to students beginning graduate work so that the fellow can devote his first year entirely to study. As part of the continuing policy of the Graduate College to seek out and encourage the enrollment of minority students, preference for these awards is given to members of minority groups. Most Graduate College fellows are awarded support in the form of other

fellowships or assistantships with which to continue their studies in subsequent years, provided their progress is satisfactory during the first year of study, but continued support can not be guaranteed in advance. The stipend and waiver are the same as for University fellowships; Graduate College permission is required for concurrent employment of any type.

University summer fellowships for teaching assistants are restricted to graduate students who have held at least half-time teaching assistantships at the University of Illinois at Urbana-Champaign the preceding year, who have earned not less than two units of graduate credit during that year, and who have demonstrated superior scholarship. Fellows are selected in a campuswide competition. The stipend is $500 for the eight-week summer session and an exemption from tuition and fees.

Industrial, Endowed, and Special Fellowships and Traineeships. Through their generosity and interest, a number of firms, foundations, and individuals support a number of fellowship awards for graduate students. The stipends and supplemental allowances for these fellowships vary, and most of them are restricted to students in particular areas of study. In almost all cases these awards provide for tuition and fees. Information on applying for industrial, federal, and foundation fellowships may be obtained from the Graduate College Fellowship Office.

Federal Fellowships have been curtailed sharply in recent years, but certain programs, often restricted to specialized fields of study, have been maintained. Many include dependency allowances and, almost without exception, provide for tuition and fees. Applicants for most federal fellowships must be U.S. citizens or nationals.

Office of Education Fellowships. Fellowships are available in specialized areas of training of teachers and other school personnel from preschool through college levels. A student who expects to major in a department in the College of Education should direct inquiries to the Coordinator of Graduate Study, University of Illinois at Urbana-Champaign, College of Education, 110 Education Building, Urbana, Illinois 61801, indicating a particular field of interest. Inquiries about teacher-training programs in academic fields should be directed to the student's major department.

Fellowships Awarded in National Competitions. Various kinds of fellowships are awarded in rigorous national competitions and in most cases may be used at the college or university chosen by the recipient. Applications for these awards are obtained from and submitted directly to the granting agency.

The principal remaining general federal competition is for National Science Foundation graduate fellowships. Approximately 500 are awarded annually in the mathematical, physical, medical, and biological sciences, engineering, social sciences, and in the history and philosophy of science. These fellowships are restricted to students who have completed not more than one year of full- or part-time graduate study; they will be continued for up to three years subject to the availability of funds and the student's satisfactory progress. Preliminary application materials are available early each fall from the Graduate College Fellowship Office, 311 Administration Building.

Assistantships

The various departments of the University appoint graduate students as teaching or research assistants, usually for half-time service; the current salary for a half-time appointment is $358.33 per month and is subject to income taxes. Application should be made directly to the appropriate department. Assistants holding appointments ranging from 25 through 67 percent time are exempt from tuition and the service fee, but not from the hospital-medical-surgical fee.

A student may also apply for a part-time assistantship outside his major department in one of the nonteaching bureaus or agencies in the University such as the Institute of Government and Public Affairs or the Small Homes Council–Building Research Council.

Part-time appointments as student residence hall advisers are also available. These provide cash stipends and room and board, as well as the same exemption from tuition and the service fee accorded other assistants. Applications are available from the Student Affairs Coordinator for Staff Development, University of Illinois at Urbana-Champaign, 200 Clark Hall, Champaign, Illinois 61820.

Resignations. Students who resign their appointments before rendering service for at least three-fourths of the semester will be assessed tuition and fees unless they either withdraw from the University on the same date as the resignation or file a clearance form for graduation within one week following the date of resignation.

Tuition and Fee Waivers

In addition to the tuition and fee waivers in connection with fellowships, a number of waivers are awarded each year in a campuswide competition. These waivers provide exemption from the tuition and service fee, but not from the hospital-medical-surgical fee

(currently $37 per semester), for the academic year and summer session immediately preceding or following. Students holding waivers must be in residence and must register for at least three units each semester during the academic year; they may also accept part-time or incidental employment not to exceed twenty hours a week, either with the University or with outside agencies.

Veterans who are admissible to a graduate program and who meet certain residence requirements may be eligible for exemption from tuition under the state statute concerning military scholarships. Further information may be obtained from the Director of Student Financial Aids, 420 Student Services Building, 610 East John Street, Champaign, Illinois 61820.

How to Apply

A single Application for Graduate Appointment, available from the Graduate College or from any graduate department, submitted to a student's major department, ensures consideration for fellowships (except those awarded in national competitions), waivers, and departmental assistantships. The Graduate College administers most fellowship and waiver awards. The application consists of a form which requests basic information about the candidate, his personal statement, three letters of reference, and transcripts. Financial need is not considered in awarding fellowships, tuition waivers, or assistantships administered by the University.

To be considered for most fellowships beginning with the summer session or fall semester, the application must be filed with the major department no later than February 15, but preferably early in January. (The School of Music deadline is February 1, with the exception that applications in the area of voice are due January 15.) It is very important that applications be complete by the deadline date. Departments may, at their discretion, accept applications for assistantships and tuition and fee waivers after the February 15 deadline; however, many departments choose assistants at the time fellowship applications are considered. A departmental committee may recommend a fellowship or tuition and fee waiver to the Graduate College, which makes final selection of the fellows and recipients of tuition and fee waivers. Each department appoints its teaching or research assistants, with approval of the Graduate College. Fellowships can be awarded only to students who are enrolled in or have applied for admission to the Graduate College as degree candidates. The first list of fellowship awards is announced in mid-March.

Loans and College Work-Study

Graduate students may request information about National Direct Student Loans and College Work-Study from the Office of Student Financial Aids, 420 Student Services Building, 610 East John Street, Champaign, Illinois 61820. The application period begins in January of each year; the priority deadline for applications is March 1. NDSL loans and College Work-Study are based on financial need; the application may require documentation of such need as a result of a change in the law effective March 1, 1973. Loan and work-study applications are made separately from applications for fellowships, assistantships, or tuition and fee waivers.

Graduate students may also apply for guaranteed loans through lenders in their home towns who may participate in one of the various types of guaranteed loan programs. Applications should be submitted late in the spring term for the following academic year. Students are advised to delay processing the guaranteed loan application until after applying and receiving a response in relation to fellowships, assistantships, tuition and fee waivers, NDSL loans, and College Work-Study. An information brochure, "Financial Aid for Students," and application forms are available from the Office of Student Financial Aids.

In addition to major educational loans, the University makes special funds available. Short-term emergency loans for a maximum of $100 must be repaid within sixty days, or by the end of the semester, whichever date is earlier. Intermediate loans in amounts not to exceed $250, subject to available funds, may be made to help meet special financial needs of students who can also demonstrate evidence of means of complete repayment during the academic year. Applications may be obtained from the Student Personnel Office, 130 Student Services Building, 610 East John Street, Champaign, Illinois 61820.

ACADEMIC AND OTHER REGULATIONS

Responsibility for complying with the regulations of both the Graduate College and the major department and for fulfilling all requirements for the particular degree rests with the student. These requirements are outlined in this catalog and, in many cases, in departmental brochures. A Graduate College calendar, listing specific holidays, deadlines, and other important dates may be obtained from the Graduate College, 330 Administration Building.

Graduate Credit

Graduate credit is measured in terms of units, with one unit considered the equivalent of four semester hours. The normal program for a full-time graduate student is four units each semester or two units for an eight-week summer term. With the approval of the adviser the load may be increased to a maximum of five units in a semester, or two and one-half units in a summer term, provided the student is not employed. Reference to maximum credit loads for employed students is on page 24.

Although credit earned by passing proficiency examinations can not be applied to the requirements for an advanced degree, such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in an area considered to be important to a student's program of study. Students should consult their major advisers before applying for proficiency examinations.

Grading System

Final grades for courses are recorded as follows: A, B, C, D (lowest passing grade), and E (failure), with numerical computations of grade-point averages based on a system where A=5.0. Other symbols in use, but not included in the computation of grade-point averages, are:

W—Officially withdrawn from a course.

Ex—Temporarily excused. An extension of time granted by the instructor to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next semester. Failure to complete the work within this time automatically results in a grade of E.

Df—Grade temporarily deferred. Used only in research courses and other approved courses that extend beyond one semester.

S or U—Satisfactory or unsatisfactory. Used only as final grades for the thesis research course (499) and in certain other approved courses.

P or F—Pass or fail. Used only if a graduate student has registered for a course under the pass-fail option with the approval of the major department. See below.

Pass-Fail Option

Subject to the restrictions imposed by the major department, a graduate student with the adviser's approval may register for graduate credit under this option with the understanding that there must be at least two units of course work on the Urbana-Champaign campus with grades of A through D for every unit taken on a pass-fail basis. Students may elect this option only during advance enrollment, during regular registration days, or within the first two weeks of the term. At any other time, requests to take a course on this basis, or to retain the course and drop the option, will not be granted.

Scholastic Requirement for Degree Conferral

The minimum admission average required by the Graduate College for an advanced degree is 3.75 (A=5.0), but the average required by the major department may be higher than 3.75. The grade-point average (GPA) is computed at the end of every term and is shown on the Semester Report that is mailed to each student as soon as possible after the final day of examinations. The GPA computation includes only units with grades of A through E. It excludes grades of Pass, Fail, Ex, Df, S, U, and credit for work completed elsewhere. A student who receives a grade of E should consult with an adviser to determine whether the course should be repeated and whether or not credit earned in that course, if repeated with a passing grade, may be applied to an advanced degree. Repetition of the course, however, does not eliminate the original grade of E from the transcript or from the computation of the grade-point average.

A student who has completed four or more units with an average of less than 3.75 receives a warning letter from the Graduate College. If the average has not been raised to 3.75 upon completion of four additional units, or if the average falls below 3.75 thereafter, the student is disqualified as a degree candidate. Attainments other than satisfactory grades, however, are taken into consideration by the adviser and the major department in determining qualifications for an advanced degree.

Minimum and Maximum Registration

Students holding fellowships awarded or administered by the University must carry a full program of four units or the equivalent each semester. Those awarded tuition and fee waivers must enroll in at least three units or the equivalent. Occasional exceptions

to these minima may be made by the Graduate College upon the recommendation of the major department.

The maximum amount of credit for which a graduate student may register in a single term is limited by the Graduate College and by the departments, which may hold students to still lower maximum registration limits. Copies of the Graduate College regulation on maximum registration, including a table of enrollments for employed and unemployed graduate students, are available from the Graduate College and most departmental offices.

Interdisciplinary Programs

The last sections of this bulletin describe the disciplinary programs of study offered on this campus of the University of Illinois. Reference is also made to a few interdisciplinary areas of concentration such as Population Studies, Romance Linguistics, Latin American Studies, and Russian Language and Area Studies. With the approval of the adviser and the major department, however, an unlimited number of individually designed areas of concentration may be arranged for the student who is majoring in an established degree program. These areas may provide for interdisciplinary approaches to specific problems by combining courses offered by the major department with courses in other fields which would contribute to the particular educational objective.

Work Completed Elsewhere

A candidate for the doctorate who has received a master's degree from a recognized institution is considered to have completed the first stage of a doctoral program (see page 29). If the courses involved are to be used in partial fulfillment for the requirements for the doctorate, the candidate is examined on the content at the time of the preliminary examination.

A student who has completed graduate work in a recognized institution, but has not taken a degree, may petition to obtain credit toward an advanced degree by passing examinations in this work. Admission to such examinations requires the approval of the departments concerned; acceptance of credit requires the approval of the Graduate College.

Credit for certain courses offered through interinstitutional arrangements to which the University of Illinois at Urbana-Champaign is a party may be obtained by petition. Under these circumstances the department involved may elect to waive the examination.

Information regarding these courses should be obtained from the department in which the degree is sought. The acceptance of credit for work completed elsewhere does not reduce the residence requirement for an advanced degree, described on page 19.

Time Limit for Advanced Degrees

A candidate for the master's degree must complete all requirements for the degree within five calendar years after initial registration in the Graduate College.

A candidate for the doctor's degree must complete all requirements for this degree within seven calendar years after initial registration in the Graduate College, except as noted in the following paragraph.

A candidate for the doctorate who has received a master's degree elsewhere must complete all requirements for the degree within five years after initial registration in the Graduate College. A student whose program of study is significantly interrupted after receiving a master's degree from the University of Illinois and who later returns to work for the doctorate will have five years from the date of return to complete degree requirements.

Programs of Study

A student's courses and research are planned with an adviser. Consideration is given to previous academic training, career objective, and the general requirements of the Graduate College and the major department. The student should become familiar with these requirements and satisfy them as soon as possible. Each department determines its own foreign language requirement, if any, or the options that may be substituted. Special courses without graduate credit, designed for students preparing to meet a language requirement, are offered by the language departments.

Conferring of Degrees

Advanced degrees are conferred in January, May, August, and October; the doctorate is not awarded in August. No student will be awarded more than two graduate degrees for work completed at the University of Illinois.

THE MASTER'S DEGREE

Unless otherwise specified in the departmental listings, the credit requirement for this degree is at least eight units. At least three of the eight units must be in courses numbered in the 400 series, and two of these three must be in the major field.

At least one-half of the minimum units required for the degree must be in courses meeting on the Urbana-Champaign campus, or in courses meeting in other locations approved by the Graduate College for residence credit for the degree sought.

Thesis

No more than three units of thesis credit may be included in an eight-unit program. Credit in thesis research can not be applied to a degree unless a thesis is submitted. The thesis must be the work of a single author.

For specific instructions regarding the format of the thesis, the student should obtain a copy of the leaflet *Instructions for Preparation of Theses* from the Graduate College Thesis Office, 320 Administration Building.

Master's Degrees in Teacher Education

Master's degrees in teacher education require at least four units of graduate study in the major field, two units of electives, one unit in educational psychology, and one unit in history and philosophy of education. Detailed information concerning specific requirements within these areas, as approved by the Urbana Council on Teacher Education, may be obtained from appropriate departmental offices and advisers.

A limited number of applicants who have not completed requirements of a four-year undergraduate curriculum leading to teacher certification may be admitted to these programs on the approval of the appropriate adviser and the Coordinator of Teacher Education. Such students must complete teacher certification requirements, a well as the usual program requirements, in order to qualify for the master's degree in teacher education.

In general, the graduate student admitted with certification deficiencies must meet the general education requirements and teaching field requirements equivalent to those of the appropriate undergraduate curriculum as determined by the adviser. Teacher certification requires a minimum of eighteen semester hours of professional education, including student teaching. Graduate courses in professional education may be applied toward fulfillment of certification requirements.

Students wishing to pursue both certification and master's degree requirements may obtain information from the Office of the Coordinator of Teacher Education, University of Illinois at Urbana-Champaign, 120 Education Building, Urbana, Illinois 61801.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy is offered in nearly all of the departments and divisions. For further information, consult departmental sections. General requirements are described below; special requirements are given in departmental listings. For information about doctoral-level professional degrees in art, education, law, music, social work, and psychology, see the appropriate section.

Residence and Credit Requirements

A doctoral program covers three stages, as defined below and includes at least twenty-four units. At least sixteen units, including thesis credit, must be in courses meeting on the Urbana-Champaign campus or in other locations approved by the Graduate College for residence credit for the degree sought. In absentia registration for thesis credit requires prior approval of the Graduate College.

The *first stage* ends when the student receives the master's degree or earns the equivalent credit (eight units or thirty-two semester hours); the *second stage* ends when the departmental course and credit requirements have been fulfilled and the student has passed the preliminary examination; the *third stage* is devoted to research, seminars, the dissertation, and the final examination. During all three stages the student is expected to register for a full program or if employed, for the maximum credit allowed under the terms of appointment.

Candidates in the third stage must continue to register each semester until the dissertation is deposited in the Graduate College. Candidates who are in absentia register for at least one unit each semester until the dissertation is completed or the minimum credit requirement of twenty-four units has been met, whichever comes first. If the credit requirement is fulfilled before the dissertation is completed, the candidate in absentia may register in 499 for zero credit.

Doctoral Examinations

To enter the third stage of a doctoral program (see above), a candidate must pass a preliminary examination testing qualifications for further advanced study and research. The examination may be written, oral, or both, according to departmental requirements. The candidate is certified for admission to the third stage by a committee appointed by the dean of the Graduate College on the recommendation of the executive officer of the major department. To

maintain degree candidate status, a student who has passed the preliminary examination must register each regular semester until the degree is conferred. If a student does not complete the degree requirements within five years after passing the preliminary examination, a second preliminary examination is required. This does not alter the time limit for the advanced degree as described on page 27.

The candidate is admitted to the final examination by the dean of the Graduate College upon completion of the dissertation and the recommendation of the major department.

Thesis

The Doctor of Philosophy is primarily a research degree, and the candidate must demonstrate a capacity for independent research by the production of an original thesis on a topic within a major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination. The thesis must be the work of a single author.

Candidates engaged in thesis research may find it desirable or expedient to publish, prior to the conferral of the degree, certain findings that later will be incorporated in the dissertation. In this case appropriate acknowledgment of the earlier publication should be included in the dissertation. The Graduate College encourages such publication, but the thesis in its entirety may not be published before all degree requirements have been completed.

Directions regarding the thesis are given in the leaflet *Instructions for Preparation of Theses* which may be obtained in the Graduate College Thesis Office, 320 Administration Building.

OTHER EDUCATIONAL OPPORTUNITIES

CIC Traveling Scholar Program

The Committee on Institutional Cooperation (CIC), a voluntary association of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its continuing effort to increase cooperative use of its member institutions' resources. The program enables doctoral-level students to spend a semester at another CIC institution in order to take advantage of special course offerings, laboratory facilities, or library collections not available at the student's own institution. Visits of Traveling Scholars are limited to one semester or two

quarters. Traveling Scholars register and pay regular fees at the home institution. Credit earned while on this program is automatically accepted by the home university.

Application forms are available in the Graduate College, 330 Administration Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

International Programs and Studies

The University of Illinois offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate student research forms an integral part of University projects in India, Costa Rica, Belize, Colombia, Iran, Puerto Rico, Tunisia, and other countries. Research opportunities are available through the Center for International Comparative Studies, the Center for African Studies, the Center for Asian Studies, the Center for Latin American and Caribbean Studies, the Center for Russian and East European Studies, the Illinois Tehran Research Unit and many departments. For full information on these opportunities, as well as other graduate study abroad programs and a wide range of courses and seminars in international studies, please write for the handbook "International Programs and Studies at the University of Illinois at Urbana-Champaign," which may be obtained from the Office of International Programs and Studies, 309 Illini Tower, 409 East Chalmers Street, Champaign, Illinois 61820.

Several curricula have overseas teaching options. As part of the master's degree in the teaching of music, mathematics, or science, internships are offered in Puerto Rico for one academic year. For information about the music option, contact Dr. Charles Leonhard, 4022 Music Building; for information about the science or mathematics option, please contact Professor Kenneth Travers, 379 Education Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801. Options including internships in Puerto Rico, Iran, and Thailand are available in the curriculum leading to the Master of Arts in the Teaching of English as a Second Language, and additional internships are anticipated in Rumania by fall of 1974. Information is available from the Director of Programs in English as a Second Language, 3070C, Foreign Languages Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801. Positions teaching English for one academic year at the junior high level in Austria are available to University of Illinois graduates and graduate students. To obtain detailed information, contact

the Department of Germanic Languages and Literatures, 3072 Foreign Languages Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

Extramural Courses

Graduate courses in several areas of study are available at various centers throughout the state. A listing of courses offered at these centers may be obtained by writing to the Office of Continuing Education and Public Service, University of Illinois at Urbana-Champaign, 118 Illini Hall, Champaign, Illinois 61820. Students who are employed full time and who wish to register for more than one unit during a semester should obtain approval from their academic adviser and from their supervisor or appropriate administrative officer where they are employed. Courses at the 400 level are graduate courses and are not open to undergraduate students.

Credit earned in extramural courses is not considered work in residence. In certain degree programs, however, varying amounts of extramural credit may be applied to degree requirements. A student who expects to qualify for a degree must consult with a faculty adviser in his major department in advance of registration to determine whether given courses are appropriate in the degree program desired and to ascertain how much extramural credit can be applied to that program.

Correspondence Courses

Credit earned in correspondence courses can not be applied toward an advanced degree. However, it is possible to fulfill certain prerequisites or remove deficiencies through correspondence work. A catalog of correspondence courses offered by the University of Illinois may be obtained from the Division of University Extension, Correspondence Courses, University of Illinois at Urbana-Champaign, 104 Illini Hall, Champaign, Illinois 61820.

The Graduate Student Association (GSA)

GSA is the organization on this campus which serves and represents the interests of graduate and professional students. The general chairman and the steering committee are elected at large by all students in the Graduate College as well as all students in the colleges of law and veterinary medicine who have baccalaureate degrees. In addition to its service functions such as the annual production of *Vade Mecum,* GSA serves as the principal channel for student input into the administration of graduate and professional education,

not only through frequent contacts with administrators but by acting as the nominating agent for student appointees to committees of the Graduate College and the chancellor.

HOUSING

Single Graduate Students. The University maintains housing for single graduate students in two residence hall complexes within easy walking distance of the campus. Each study room is furnished and directly connected with a complete bath. The bath is shared with the occupant(s) of one or two other rooms. Single and double rooms are available. Excellent lounge facilities, laundry service rooms, and vending machines provide the essential features of day-to-day living. A contract for food service in undergraduate dining halls can also be arranged.

Married Graduate Students. Married students can choose from furnished efficiency, one-bedroom, and two-bedroom apartments. Some two-bedroom units are unfurnished, but include stoves and refrigerators. Convenient laundry facilities are available.

The Housing Division also maintains a current listing of private apartments and rooms available in homes in the community. Students seeking private housing are urged to visit the campus as early as possible, as all reservations for this type of accommodation must be made in person. Anyone unfamiliar with standard leasing practices may ask a Housing Division consultant for assistance in reviewing the terms of a lease. In some instances, when demand for this type of accommodation is at a peak, it may be necessary to reserve an apartment as much as three months prior to the opening of the school term. A car is often necessary, since many available private rooms and apartments are located a considerable distance from the campus.

Applications for accommodations in the University graduate residence halls or the University-owned apartments for married students may be obtained from the Housing Information Office, 420 Student Services Building, University of Illinois at Urbana-Champaign, Champaign, Illinois 61820. Assignments are made and leases issued to applicants until all available space has been assigned. Priority in assignment is determined by the date the completed application is received by the Housing Division. No discrimination in any of these facilities may be made with respect to race, religion, and national origin. Private housing listed must also comply with this policy.

MEDICAL SERVICES

All students enrolled in credit courses and in attendance at the Urbana-Champaign campus are assessed a hospital-medical-surgical (HMS) fee which covers two separate functions: health service at the McKinley Health Center and group health insurance.

Health Service

The McKinley health service portion of the HMS fee supports the medical services available at the McKinley Health Center located on campus. Dependents are not eligible for care at the health center unless they are also enrolled students at the Urbana-Champaign campus. There are four basic types of care available at the McKinley Health Center: routine office care (outpatient section), care requiring hospitalization (inpatient section), care for injuries or acute illnesses (emergency room), and mental health care (outpatient clinic and inpatient hospitalization).

Health service physicians are available for general medical care and advice while the student is on campus. They are experienced clinicians, most of them having practiced for years as family physicians. Students may consult the health service physician of their choice by appointment. Care is similar to that offered by a private, general physician. A wide range of diagnostic tests is available to the health service physician, including laboratory procedures, x-ray examinations, and electrocardiograms. A limited pharmacy provides drugs for students when they are under the care of a health service physician.

The inpatient section of McKinley Health Center (McKinley Hospital) is a fifty-eight-bed medical hospital owned by the University and fully accredited by the Joint Commission on Accreditation of Hospitals. The medical staff includes both community and health service physicians.

A health service physician is available twenty-four hours a day for students or employees injured on the job who require emergency care.

Health service care provided by the McKinley Health Center does not depend on and is not reimbursed by any insurance plan the student may have.

Group Health Insurance

The University insurance plan provides worldwide hospital-medical-surgical coverage and the insured student has a free choice of any legally qualified hospital or licensed physician (McKinley health

services excepted). The coverage is provided on a semester basis and includes all holidays in the semester and the period between semesters. The policy provides hospital-medical-surgical insurance up to $10,000 as defined in the insurance certificate furnished to each student at registration.

Summer Coverage. Students enrolled in the second semester who do not plan to attend the summer session may elect to extend the insurance for the entire summer vacation period by making application and paying the insurance portion of the HMS fee to the Insurance Office, University of Illinois at Urbana-Champaign, B6 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820, between May 15 and through the fifth day of instruction of the summer session. Coverage of the insured student's eligible dependents may also be extended for this period. This does not include medical services at the McKinley Health Center.

Exemption from the Insurance Fees. Students presenting evidence of equivalent medical insurance coverage will be exempted from payment of the fee for the University Insurance Plan upon approval of a petition submitted to the University Insurance Office during regular registration, or within the first ten days of instruction in any semester, or within the first five days of instruction in the summer session.

TUITION AND FEES

Since these fees are subject to change, usually in an upwards direction, specific information is not given here. More recent and detailed information concerning tuition charges, regular and special fees, exceptions, and refunds is available in a leaflet that may be obtained from the Office of Admissions and Records, 100a Administration Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

In general, however, the fees assessed a resident of Illinois, including tuition, the service fee, and the hospital-medical-surgical fee, have been ranging each semester from about $145 for a credit load up to one and one-fourth unit to $343 for three or more units. Students who are not residents of Illinois have been paying from about $310 to $838 for the same credit loads. Tuition and fees for the eight-week summer term are approximately two-thirds those for the full semester.

Tuition and the service fee are waived for all academic employees of the University on appointment for at least 25 percent time but not more than 67 percent time, and for certain nonacademic employees. The nonresident portion of tuition and the service fee are waived for academic and administrative staff members on appointment with the University for 68 percent time or more. Students who hold fellowships, traineeships, or other grants that provide similar exemptions will be informed of fee exemptions at the time the award is offered.

The nonresident portion of tuition may be waived upon request for the spouses and dependent children of all staff members on appointment with the University at least 25 percent time.

Rules regulating these and other exemptions from tuition, or fees, or the nonresident portion of tuition are listed in the leaflet referred to above.

Refunds. Tuition and fees will be refunded in full if the student withdraws before the first day of instruction, and in part if the withdrawal takes place during the first ten days of instruction (first five days in the summer session). No refunds will be made after this period.

Installment Plan for Payment of Fees and Housing Charges

Students enrolled on campus may arrange during registration to pay tuition, fees, and University residence hall charges (single student housing only) on an installment basis. This plan does not apply to registration in extramural and correspondence courses.

Tuition, fees, and residence hall charges for each of the first and second semesters are collected in four installments, the first payable at registration and the others in each of the following months. Summer session charges are payable at approximately one-half the charge at registration and the remainder during the following month.

Students paying tuition and fees by installments are assessed a $2 service charge. There is no service charge for installment payment of housing accounts. Arrangements for paying housing accounts on the installment plan are made at the time the contract is signed or during registration.

Programs of Study

The graduate programs offered by the divisions, schools, institutes, centers, and departments of the Urbana-Champaign campus of the University of Illinois are described on the following pages; areas of specialization within these programs and requirements for admission to them are included. For information concerning interdisciplinary programs, see page 26.

In the departmental sections, frequent reference is made to the *admission average;* this academic average is calculated from the last sixty hours of undergraduate work, but does not include any course work taken before the beginning of the junior year. Averages are based on a scale in which the grade of A equals 5.0. Applicants with ungraded transcripts must submit supporting documents (see page 17). The 300-level courses mentioned in the text are courses for advanced undergraduates and graduate students; 400-level courses are open to graduate students only. More complete and detailed information can be found in the departmental brochures which are available upon request from the departments.

For information on financial aid see the departmental listings and also page 19.

The University publishes every two years the *Courses Catalog* which lists all the undergraduate and graduate courses offered at this campus. A listing of the courses offered each term is published in the *Timetable,* which is issued in April for the fall term, in May for the summer term, and in November for the spring term. Copies of these publications may be procured by writing to individual departments, which also issue brochures describing in detail the features of their programs, or by writing the Graduate College, 330 Administration Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

ACCOUNTANCY

Head and Director of Graduate Studies: E. J. DeMaris
Correspondence and Information: Head of the Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Commerce Building (West), Urbana, Illinois 61801

FACULTY

Professors: N. M. Bedford, G. D. Brighton, E. J. DeMaris, R. I. Dickey, C. F. Dunham, P. E. Fess, H. P. Holzer, K. W. Perry, H. M. Schoenfeld, D. H. Skadden, W. E. Thomas, V. K. Zimmerman
Associate Professors: J. W. Deskins, E. L. Elliott, J. C. McKeown, F. L. Neumann
Assistant Professors: D. L. Jensen, C. L. McDonald, H. W. Melton, W. J. Morse, R. D. Picur, J. J. Schultz, S. Yu, R. E. Ziegler

Graduate Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science and Doctor of Philosophy in Accountancy. For graduates of business schools with credit in appropriate undergraduate courses, the M.A.S. degree requirements can be completed in one year. For nonbusiness graduates, the M.A.S. can be earned in two years. The Ph.D. degree takes approximately two years of full-time study and research beyond the M.A.S. degree.

Admission and Aid. The admission average required in accountancy is 4.0. Applicants with lower averages will be considered if other compelling evidence of admissibility is offered. All applicants, native or foreign, are required to take the Admission Test for Graduate Study in Business. This test should be taken early enough to insure that the results will be available to the department prior to action on admission. Financial aid is available to qualified students in the form of special grants, fellowships, assistantships, and waivers of tuition and fees.

Master of Accounting Science. All candidates take three specified graduate-level courses in accountancy. No thesis is required, although the student may elect to write one. In addition, graduate courses in microeconomic theory, operations research, and organization theory must be taken if such courses were not taken in prior academic work.

A candidate with an undergraduate background in accounting is required to complete at least eight units of work, four of which must be in accountancy. Such a student should have completed an equivalent of the undergraduate curriculum at the University of Illinois at Urbana-Champaign including the following: twenty hours of undergraduate work in accounting; introductory courses in economic theory, in computer programming and applications, and in the functional fields of business; two courses in statistics; and courses in finite mathematics and calculus.

A student with little or no business and accounting background is required to complete sixteen units of work, or the equivalent. A first-year student takes four specified graduate courses in accountancy. Depending upon background, the student also enrolls in courses in statistics, economics, operations research, enterprise organization, finance, and marketing. A student who already meets some of the requirements of the two-year program may be given some credit toward the sixteen-unit requirement. There will be opportunity to substitute elective courses for areas in which such a student can satisfactorily demonstrate proficiency. In the second year the requirements for all M.A.S. students, as described above, are followed.

Adequate provisions have been made for electives suited to the particular interests of both one-year and two-year M.A.S. students.

Doctor of Philosophy. Applications for admission to the doctoral program must be approved by the departmental admissions committee, which may require an oral or written examination. The candidate may have a master's degree in any field but must have taken course work equivalent to that required for the M.A.S. degree.

The requirements for the Doctor of Philosophy degree include the following: credit in micro- and macro-economics; a minor or minors of at least four units other than accountancy; at least eight units of accountancy, including one specified unit in accountancy, or equivalent (substitution of courses from other departments may be made with the adviser's approval); and additional units to bring the total to at least twenty-four, including the eight units allowed for a master's degree. Eight of the twenty-four must be doctoral dissertation units. The student's doctoral program is determined in consultation with a faculty adviser. The student's tentative plans for the doctoral dissertation serve as a guidepost in planning the program.

In addition to the major and minor requirements above, the candidate must satisfy a nonbusiness field requirement and must pass an oral and written preliminary examination and an oral final examination on his doctoral dissertation. In the preliminary examinations, the candidate must demonstrate a thorough knowledge of accounting theory in both its external and internal dimensions, of research methods, and of the areas of accountancy in which he specialized; a general acquaintance with the subject matter and bibliography of other areas of accountancy; and proficiency in minor fields and in the required areas of economic theory, quantitative methods, and organization theory.

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively a constituent part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to assist accounting faculty and able students from other countries to come to the University of Illinois at Urbana-Champaign for study and research in accountancy. The staff of the center, composed of outstanding teachers and researchers from foreign countries, also conducts seminars and courses for graduate credit.

Inquiries concerning the center should be directed to Professor V. K. Zimmerman, Director, Center for International Education and Research in Accounting, University of Illinois at Urbana-Champaign, 320 Commerce Building (West), Urbana, Illinois 61801

ADVERTISING

Head of the Department: S. Watson Dunn
Correspondence and Information: Head of the Department of Advertising, University of Illinois at Urbana-Champaign, 103 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: A. M. Barban, S. W. Dunn, N. Wedding
Associate Professor: K. B. Rotzoll
Assistant Professors: J. E. Haefner, R. N. Nielsen, S. J. F. Unwin, G. E. White

Graduate Program. The Department of Advertising offers graduate work leading to the Master of Science in Advertising. For the program leading to the Doctor of Philosophy in Communications, see page 60.

Admission and Aid. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an institution of recognized standing. An admission average of at least 4.0 is normally required. Applicants with averages below 4.0 are considered on an individual basis. All applicants are urged to take either the Graduate Record Examination or the Admission Test for Graduate Study in Business and to attach to their application a short essay indicating why they want to take graduate work

in advertising. Financial aid is available to students in the form of fellowships, research and teaching assistantships, waivers of tuition and fees, and long-term loans.

Master of Science. Most students, either with or without an undergraduate major in advertising, can usually earn the Master of Science degree in one calendar year of study. Registration must include a minimum of four units in advertising including at least three units in 400-level courses. At least two units of nonadvertising courses are required. The total minimum requirement is eight units with thesis, or nine units without thesis, provided that at least four such units be in 400-level courses.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Head of the Department: H. S. Stillwell
Director of Graduate Studies: H. H. Hilton
Correspondence and Information: Director of Graduate Studies, Department of Aeronautical and Astronautical Engineering, University of Illinois at Urbana-Champaign, 101 Transportation Building, Urbana, Illinois 61801

FACULTY

Professors: C. E. Bond, H. H. Hilton, C. O. Hopkins, H. W. Knoebel, Y. K. Lin, R. W. McCloy, A. I. Ormsbee, S. N. Roscoe, H. S. Stillwell, R. A. Strehlow, S. M. Yen, A. R. Zak
Associate Professors: H. O. Barthel, H. Krier, J. E. Prussing, L. H. Sentman, K. R. Sivier
Assistant Professor: J. A. Bennett

Graduate Programs. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Students interested in mass transportation and deep sea submergence vehicles, for example, find the graduate study in this department very applicable. Typical areas of concentration are aerodynamics, aeroelasticity, space mechanics, flight mechanics, propulsion, structural mechanics, optimization and control, manual control and display systems, human factors in aerospace systems, and air and noise pollution.

Admission and Aid. The prerequisite for graduate study normally is the equivalent of the undergraduate courses required at the University of Illinois for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study. Although an applicant is expected to have an admission grade-point average of at least 4.0, admission may be granted when the average is from 3.75 to 4.0 if supporting data indicates a high probability of success in advanced study. Financial aid is available in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Science. Candidates for the degree of Master of Science are required to complete a minimum of eight units of graduate work, including a thesis. It is possible for a student with a one-half time appointment to complete the requirements for the M.S. degree in two regular semesters and a summer session, or three regular semesters.

Doctor of Philosophy. Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for a major in the program of study leading to the degree of Doctor of Philosophy. Each student plans a study program in consultation with a departmental adviser. Courses offered by departments other than aeronautical and astronautical engineering may be included in the major area of study when these courses are of particular value to the work which students desire to emphasize. The major and minor programs must meet with the approval

of the head of the department. Minimum requirements for the degree consist of eight units of course credit beyond the master's degree, successful completion of the preliminary examination, and a satisfactory thesis developed from eight units of thesis research. A reading knowledge of one foreign language is required.

AGRICULTURAL ECONOMICS

Head of the Department: Richard L. Feltner
Correspondence and Information: Head of the Department of Agricultural Economics, University of Illinois at Urbana-Champaign, 304 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: C. B. Baker, G. K. Brinegar, E. E. Broadbent, B. L. Brooks, F. Dovring, J. Due, R. L. Feltner, F. C. Fliegel, H. G. Halcrow, T. A. Hieronymus, L. D. Hill, G. G. Judge, N. G. P. Krausz, A. G. Mueller, R. J. Mutti, F. J. Reiss, J. R. Roush, S. C. Schmidt, H. J. Schweitzer, J. T. Scott, R. G. F. Spitze, E. R. Swanson, T. Takayama, W. N. Thompson, R. N. Van Arsdall, V. I. West
Associate Professors: C. A. Bock, D. E. Erickson, L. P. Fettig, T. L. Frey, H. D. Guither, J. W. Gruebele, A. G. Harms, R. W. Herdt, R. A. Hinton, M. B. Kirtley, R. M. Leuthold, J. W. Robinson, W. D. Seitz, J. C. vanEs, M. M. Wagner
Assistant Professors: E. D. Kellogg, D. A. Lins, A. J. Sofranko

Programs and Fields of Study. The Department of Agricultural Economics offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Study programs can be organized with concentrations in production economics and resource organization, agricultural marketing and prices, agricultural economic policy, firm management and decision making, agricultural finance, quantitative methods and research methodology, international agricultural development, natural resource economics and regional development, international trade, rural sociology, and agricultural law.

Admission and Aid. The admission average required is 4.0. Credentials of applicants with averages below 4.0 but above 3.75 will be reviewed, and applicants may be admitted under special circumstances. Students having less than twelve hours of agricultural economics and economics may be required to take additional courses to adequately prepare them for graduate study. Students who desire to specialize in rural sociology should have had a minimum of six hours of sociology. Fellowships, research assistantships, and tuition and fee waivers are available to a limited number of students and are offered on a competitive basis.

Master of Science. Two units in economics, at least one of which must be economic theory, and a minimum of four units of agricultural economics, including thesis credit, are required. At least three units must be in 400-level courses, two of which must be in agricultural economics. No more than two units from thesis credit may be included in the minimal eight-unit program. The thesis may be waived under certain conditions. The program is designed to be completed in one year of full-time study.

Doctor of Philosophy. The doctoral candidate must complete eight units of nonthesis courses beyond the M.S. degree. The total graduate program must include a minimum of three units in economics, including one unit each of micro and macro theory, both at the 400 level, and two and one-half units in quantitative methods and research methodology. The student must pass written and oral preliminary examinations, submit an acceptable dissertation, and pass a final oral examination.

For further information and a copy of the graduate program brochure, write to the address above.

AGRICULTURAL EDUCATION

Chairman of the Agricultural Education Division, College of Education: PAUL E. HEMP
Assistant Dean, College of Agriculture: CECIL D. SMITH
Correspondence and Information: Division of Agricultural Education, University of Illinois at Urbana-Champaign, 357 Education Building, Urbana, Illinois 61801

FACULTY

Professors: P. E. HEMP, L. J. PHIPPS
Associate Professors: R. W. WALKER, D. L. WILLIAMS

Graduate Programs. The Master of Science in Agricultural Education has been planned as a fifth year of work for students who have completed the requirements of the four-year agriculture curriculum for secondary teachers of agricultural occupations, or its equivalent.

Admission and Aid. The admission average is 3.5. The program is open only to students who have met the requirements for teaching agriculture. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. Candidates must earn four units in agriculture, two units in education, and two units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields.

A minimum of four units must be taken in residence. A maximum of four of the required eight units may be earned in extramural courses offered by the University of Illinois; of these four units, no more than two units may be in agriculture and no more than two units may be in education.

In order to fulfill one of the objectives of this program, that of broad general training in technical agriculture at the graduate level, the agriculture courses and electives must be selected with the approval of the adviser. In general, agriculture courses are selected from at least three subject-matter departments with no more than three units from any department.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for the Department of Vocational and Technical Education in the College of Education.

AGRICULTURAL ENGINEERING

Head of the Department: FRANK B. LANHAM
Correspondence and Information: Head of the Department, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign, 245 Agricultural Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: B. J. BUTLER, J. O. CURTIS, D. L. DAY, R. F. ESPENSCHIED, E. L. HANSEN, D. R. HUNT, B. A. JONES, JR., F. B. LANHAM, J. W. MATTHEWS, E. F. OLVER, H. B. PUCKETT, G. C. SHOVE, J. A. WEBER, R. R. YOERGER
Associate Professors: W. D. LEMBKE, E. D. RODDA, J. C. SIEMENS
Assistant Professors: D. L. HOAG, J. K. MITCHELL, W. R. NAVE

Graduate Programs. The Department of Agricultural Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The stu-

dent may specialize in power and machinery (soil dynamics, tillage, noise and vibration, vehicle stability, operations analysis, pesticide application, and harvesting efficiency); soil and water mechanics (hydraulics of structures, agricultural hydrology, drainage, mechanics of erosion, and water quality); farm structures (structural analysis and design, environmental control, air contaminates, and waste disposal); or processing (systems analysis for farmstead mechanization, crop conditioning and processing, physical properties of agricultural products, and food engineering).

Admission and Aid. The admission average required is 4.0; however, applications of those with averages below 4.0 but above 3.75 are reviewed by the departmental graduate committee, and admission may be recommended if credentials are satisfactory. Financial aid is often available in the form of fellowships, assistantships, and waivers of tuition and fees.

Requirements. Candidates must have completed the equivalent of the undergraduate curriculum at the University of Illinois. Candidates for the Doctor of Philosophy must fulfill all the standard requirements of the Graduate College. The program provides for a major in agricultural engineering with a minor in other graduate departments of engineering, mathematics, physics, including soil physics, or other disciplines in the physical sciences.

Opportunity for independent study and research is an important part of both the Master of Science and the Doctor of Philosophy programs. Research opportunities are available in both the Agricultural and Engineering Experiment Stations. For the master's degree, a thesis involving an analytical or experimental investigation and satisfying about one-fourth of the credit for the program is normally required.

AGRONOMY

Head of the Department: Robert W. Howell
Correspondence and Information: Head, Department of Agronomy, University of Illinois at Urbana-Champaign, W-201 Turner Hall, Urbana, Illinois 61801

FACULTY

Professors: D. E. Alexander, A. H. Beavers, R. L. Bernard, J. S. Boyer, C. M. Brown, A. W. Burger, S. G. Carmer, J. M. J. de Wet, J. W. Dudley, E. B. Earley, J. B. Fehrenbacher, J. E. Gieseking, J. W. Gerdemann, D. W. Graffis, H. H. Hadley, R. H. Hageman, J. B. Hanson, J. R. Harlan, C. N. Hittle, A. L. Hooker, R. W. Howell, J. A. Jackobs, E. L. Knake, L. T. Kurtz, J. R. Laughnan, G. E. McKibben, S. W. Melsted, D. A. Miller, W. R. Oschwald, D. B. Peters, M. B. Russell, W. O. Scott, R. D. Seif, F. W. Slife, F. J. Stevenson, M. D. Thorne, E. H. Tyner, L. F. Welch, C. M. Wilson
Associate Professors: J. D. Alexander, R. L. Cooper, R. C. Hiltibran, T. D. Hinesly, T. Hymowitz, R. L. Jones, D. E. Koeppe, R. J. Lambert, M. D. McGlamery, W. L. Ogren, E. B. Patterson, T. R. Peck, B. W. Ray, R. W. Rinne, E. W. Stoller, W. M. Walker, L. M. Wax, E. J. Weber, J. M. Widholm, J. T. Woolley
Assistant Professors: C. W. Boast, M. A. Cole, J. E. Harper, J. J. Hassett, R. G. Hoeft, R. R. Johnson, E. R. Perrier

Graduate Programs. The Department of Agronomy offers graduate work leading to the Master of Science and Doctor of Philosophy. The student may specialize in crops (breeding and genetics, evolution, production, morphological development, physiology, plant chemistry, weeds and their control); soils (biology, chemistry and biochemistry, fertility, genesis, morphology and classification, management, physical and colloidal chemistry, physical edaphology, physics); or biometry.

Admission and Aid. The student must show promise of achievement in his chosen field, must have an admission average of 3.75 or higher, and must be approved by the Department of Agronomy. Students having averages below 4.0 but above 3.75 must have unusually strong training in the basic sciences to be considered for admission. Adequate preparation for graduate work in soils includes courses in physics, chemistry, geology, microbiology, and mathematics; in crops, courses in botany, chemistry, genetics, and statistics; in biometry, courses in mathematics, statistics, and computer programming. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. A candidate must present an acceptable thesis, unless this requirement is waived by petition, and pass an oral examination.

Doctor of Philosophy. A candidate must complete a minimum of twenty-four units of graduate study and must demonstrate competence in two foreign languages or take one and one-half units of course work in each language. At least four units of 300- or 400-level courses outside the Department of Agronomy are required.

ANIMAL SCIENCE

Head and Graduate Supervisor: D. E. Becker
Correspondence and Information: Head of the Department, Department of Animal Science, University of Illinois at Urbana-Champaign, 328 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: D. E. Becker, O. G. Bentley, D. J. Bray, J. E. Corbin, P. J. Dziuk, R. M. Forbes, U. S. Garrigus, E. E. Hatfield, A. H. Jensen, S. P. Mistry, A. V. Nalbandov, A. L. Neumann, H. W. Norton, B. A. Rasmusen
Associate Professors: W. W. Albert, D. H. Baker, B. G. Harmon, P. C. Harrison, F. C. Hinds, J. R. Romans
Assistant Professors: S. E. Curtis, T. G. Lohman, F. N. Owens, G. R. Schmidt

Graduate Program. The Department of Animal Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Study and research may be pursued in the following areas of specialization: population and immunogenetics, physiology of reproduction including endocrinology, environmental physiology, animal nutrition, nutritional biochemistry, meat science and muscle biology, and world animal agriculture. In addition, a student who expects to terminate the graduate program at the master's level may pursue work in animal management or production. Beef cattle, horses, poultry, sheep, swine, and a wide variety of laboratory animals are available for study.

Admission and Aid. Students are considered for admission with full standing if they have an admission average of 4.0. Under exceptional circumstances the department will also consider otherwise well-qualified students whose average is below 4.0 but above 3.75. Courses in biological and physical sciences and mathematics are essential preparation for graduate work in any specialized area of animal science. Candidates specializing in the areas of animal nutrition or nutritional biochemistry must have training equivalent to one five-hour course each in quantitative analysis and organic chemistry; a course in physical chemistry is strongly recommended. Candidates specializing in meat science should have undergraduate training in meat evaluation, use, and/or processing, and in microbiology. Students lacking adequate background to register in graduate courses at the University of Illinois are expected to remove course deficiencies during the first year of graduate study. The department desires applicants with a strong undergraduate de-

gree in animal science and with real promise of completing degree requirements in reasonable time. Financial aid is available to a limited number of students in the form of fellowships, traineeships, and teaching and research assistantships.

ANTHROPOLOGY

Head of the Department: Clark E. Cunningham
Director of Graduate Studies: F. K. Lehman
Correspondence and Information: Graduate Secretary, Department of Anthropology, University of Illinois at Urbana-Champaign, 109 Davenport Hall, Urbana, Illinois 61801

FACULTY

Professors: E. M. Bruner, J. B. Casagrande, C. E. Cunningham, E. Giles, H. A. Gould, D. W. Lathrap, F. K. Lehman, J. C. McGregor (Emeritus), B. Nettl, D. W. Plath, D. B. Shimkin, V. C. Uchendu, N. E. Whitten, Jr., R. T. Zuidema
Associate Professors: D. S. Butterworth, D. C. Grove, C. M. Keller, H. M. Ross
Assistant Professors: C. J. Bareis, J. C. Brukman, L. C. Crissman, L. L. Klein, L. K. Klepinger, B. J. Peterson, J. O Stewart

Graduate Programs. The Department of Anthropology offers work leading to the degrees of Master of Arts and Doctor of Philosophy. The master's degree can be a first stage toward the doctorate or can be used by students wishing ultimately to apply a knowledge of anthropology in some related field. The doctoral program is designed primarily to train scholars and teachers of the subject, but also increasingly to prepare professionals to work in nonacademic contexts; the master's degree is not required of all students going on to the doctorate. Courses and guided study provide broad coverage with concentration in the ethnology of Latin America, aboriginal North America, Japan, China, Indonesia, South and Southeast Asia, Africa south of the Sahara, and Oceania; cultural, historical, and archaeological methods; culture change and modernization in complex societies; urban anthropology; human ecology, structural, and formal analysis of cultural systems; and ethnolinguistics and ethnomusicology. Relevant courses are offered in other fields, such as linguistics, history, sociology, geography, agricultural economics, life sciences, and preventive medicine. The department also helps support student attendance at field schools and study in mathematics, languages, and related subjects at summer institutes.

Opportunities for original research in the field, laboratory, and library include participation in faculty research projects, attendance at University of Illinois archaeological and ethnological field schools held every summer, as well as independent graduate student research in the United States and abroad. Library and computer facilities on campus are outstanding.

Admission and Aid. Applicants as first-year graduate students must ordinarily have an admission average of 4.0 in order to be considered for admission. Consideration may, however, be given to applicants with a grade-point average between 3.5 and 4.0 if the student has special skills or experience relevant to the study of anthropology. A student without the equivalent of this department's undergraduate major may be permitted to register for graduate courses but will be required to make up any deficiencies in this background. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts. A candidate for the master's degree must accumulate at least eight units of graduate credit and present an acceptable thesis or essay in lieu of thesis. The degree should be earned in not more than two years.

Doctor of Philosophy. A candidate for the doctor's degree must take at least eight units beyond those for the master's and must present a predoctoral research paper of substantially original content before the preliminary examinations. The student will then undertake extended original research leading to a thesis, which is defended for the degree. The doctoral degree normally takes from four to six years to earn. The student must demonstrate ability to use for scholarly purposes either one foreign language at a high level of proficiency or two at ordinary reading proficiency. The level to be tested and languages will be chosen by the student's advisory committee, which is appointed early in the student's second year of residence.

ARCHITECTURE

(Including Architectural Engineering)

Head of the Department: G. Day Ding
Correspondence and Information: Head, Department of Architecture, University of Illinois at Urbana-Champaign, 104 Architecture Building, Champaign, Illinois 61820

FACULTY

Professors: J. S. Baker, A. C. Bianchini, L. J. Brightbill, G. T. Clayton, P. H. Coy, W. L. Creese, G. D. Ding, W. Eng, W. L. Fash, H. L. Hornbeak, P. E. Irgens, S. T. Lanford, W. H. Lewis, C. B. Looker, C. T. Marfort, H. J. Miller, F. D. Moyer, J. D. Noble, A. Notaras, W. J. O'Connell, J. G. Replinger, I. Schousboe, R. J. Smith, J. H. Swing, S. J. Y. Tang, C. A. Winkelhake, H. C. Young
Associate Professors: R. L. Amico, V. V. Cafourek, E. E. Flynn, R. A. Forrester, G. Francescato, J. F. Knight, L. A. Leffers, C. A. Moyer, J. W. Murdock, J. E. Simon, R. L. Tavis, H. C. White, R. L. Wright
Assistant Professors: R. J. Betts, E. H. Clay, S. V. Curcic, B. L. Hutchings, B. B. Kesner, H. C. Leung, R. T. Mooney, W. H. Russell, J. M. Smith, J. P. Warfield, D. Wickersheimer, M. G. Williams

Graduate Programs. The Department of Architecture offers graduate work leading to the Master of Architecture, a professional degree. Graduate work places emphasis upon advanced study in architectural disciplines, election of an optional area of concentration, and participation in creative research.

Advanced study in architectural disciplines, building upon the fundamentals established in undergraduate study, comprises the initial phase of the graduate program; it is a two-semester integrated sequence in architectural administration, construction, design, and structures. This work completes the common core of professional course work required of all candidates for the Master of Architecture degree.

Election of an optional area of concentration comprises the final phase of the graduate program and allows the student to devote two semesters' work to a specific field of his choice. The fields available include disciplines both in the Department of Architecture and in other departments. The department offers optional areas of concentration in architectural administration, construction, design, history, housing, and structures; and in urban design. Certain of these options afford the opportunity for further specialization in advocacy, behavioral cause and effect, criticism, industrialization, methods, preservation, theory, and transportation. Further, the department encourages a student with special interests to elect an optional concentration that includes course work offered in other departments. Departments in which course work may be considered include: art and design, business administration, civil engineering, electrical engineering, finance, landscape architecture, mechanical and industrial engineering, and urban and regional planning.

Participation in creative research becomes available with the election of an optional area of concentration. Research opportunities are available in current departmental and interdepartmental areas. For those qualified, these include unique research opportunities with the National Clearinghouse for Criminal Justice Planning and Architecture, a unit of the Department of Architecture; and the Housing Research and Development Program, a unit of the Graduate College.

Admission and Aid. Admission with full standing requires the Bachelor of Science in Architectural Studies from the University of Illinois, or an undergraduate degree in architectural studies or architecture equivalent to that degree; and an admission average of 3.75 or higher.

In either of the following special circumstances, admission with qualified standing may be permitted if an individual student meets the degree requirements and has an admission average under 3.75 but above 3.5, but gives evidence of other exceptional qualifications; or if an individual student has received an undergraduate degree in architectural studies or in architecture less than equivalent to the University of Illinois degree, but can establish equivalency through additional course work.

Admission with advanced standing may be permitted if an individual student has received a Bachelor of Architecture in a five-year curriculum equivalent to the combined four-year undergraduate curriculum and the first-year graduate curriculum in architecture at the University of Illinois.

Financial assistance is available to promising graduate students through fellowships, teaching and research assistantships, tuition and fee waivers, and loans.

Master of Architecture. A master's degree candidate admitted with full or qualified standing must complete, with satisfactory grades, at least 15½ units of graduate work. The candidate must spend at least four semesters and earn at least one-half of the required units in residence. A candidate admitted with full standing may complete the master's program in two full-time academic years of study.

A master's degree candidate admitted with advanced standing must complete, with satisfactory grades, the required 15½ units of work, but these units will include those professional courses accredited by his advanced standing. The candidate must spend at least two semesters and earn at least one-half of the adjusted required units in residence. A candidate admitted with advanced standing may complete the master's program in one full-time academic year of study.

Admission with qualified standing, discharge of duties required for an assistantship, or other circumstances may extend the period of study.

ART AND DESIGN

(Including Art Education, Art History, Crafts, Graphic Design, Industrial Design, Painting, Photography-Cinematography, Printmaking, and Sculpture)

Head of the Department: James R. Shipley
Associate Head: E. C. Wicks
Coordinator of Graduate Programs: Harold A. Schultz
Correspondence and Information: Coordinator of Graduate Programs in Art, Department of Art and Design, University of Illinois at Urbana-Champaign, 140 Fine Arts Building, Champaign, Illinois 61820

FACULTY

Professors: E. H. Betts, P. Bodnar, C. W. Briggs, P. Fehl, D. E. Frith, F. Gallo, F. E. Gunter, K. M. Lansing, N. T. McFarland, A. D. Moore, A. Perkins, R. Perlman, L. H. Price, E. C. Rae, J. A. Savage, H. A. Schultz, J. R. Shipley, A. R. Sinsabaugh, M. A. Sprague, R. W. Sterkel, R. A. von Neumann, A. S. Weller, E. C. Wicks, E. J. Zagorski, J. Ziff

Associate Professors: L. S. Bell, M. Franciscono, G. W. Hardiman, M. D. Hilson, T. G. Kovacs, E. Lancaster, R. Moses, K. Munakata
Assistant Professors: J. D. Colley, D. W. Pilcher, T. Zernich

Graduate Programs. The Department of Art and Design offers graduate work leading to the Master of Arts in Art Education and in Art History; the Master of Fine Arts in Art and Design with majors in Crafts, Graphic Design, Industrial Design, Painting, Photography-Cinematography, Printmaking, and Sculpture; the Doctor of Education in Art Education; and the Doctor of Philosophy in Art History.

Admission and Aid. For admission to the master's programs, the applicant must have an admission average of 3.5. Applicants are expected to have completed an undergraduate program similar to that established at this University, with an emphasis, as indicated by the transcript or its equivalent, in experience and production as indicated by examples of creative work in the area in which the applicant seeks to major in graduate study. Those intending to major in art education must have (or be eligible for) a teaching certificate in that field. Applicants for admission to the M.F.A. programs are required to submit a portfolio of examples of their creative work.

Admission to the Doctor of Education in Art Education program requires a master's degree in fine arts or art education, or the equivalent from an accredited institution as well as a minimum of two years of acceptable teaching experience. Final approval for admission is determined by examinations administered by the Department of Art and Design and the College of Education.

Applicants for admission to the Doctor of Philosophy in Art History must hold a master's degree in art history, or its equivalent, from an accredited institution. Final approval for admission is determined by the Graduate Committee in History of Art and Architecture.

Preference is given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and tuition and fee waivers.

Master of Arts. A candidate for the A.M. in Art Education or Art History must spend at least two semesters or the equivalent in residence. Satisfactory completion of eight units of course work is necessary for the degree. A reading knowledge of French or German, successful completion of a comprehensive examination, and a thesis or scholarly paper are required in art history. No thesis is required in art education.

Master of Fine Arts. Satisfactory completion of sixteen units of course work is necessary for the degree. A candidate must spend a minimum of four semesters in residence. A thesis in the form of creative work in the major field of concentration and a written report are required.

Doctoral Degree Programs. Requirements include a minimum of sixteen units of course work beyond the master's degree, satisfactory performance on preliminary and final examinations, and a thesis which meets all Graduate College regulations covering preparation and submission. Students usually require from three to five years to complete the degree requirements.

ASIAN STUDIES

(Including Burmese, Chinese, Indonesian, Japanese, Korean, Persian, and Sanskrit)

Director: Robert B. Crawford
Associate Director (South and West Asia): Harold A. Gould
Graduate Supervisor: William L. MacDonald
Correspondence and Information: William L. MacDonald, Graduate Supervisor, Center for Asian Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: E. Bruner, W. Buddemeier, R. Crawford, C. Cunningham, C. E. Dawn, L. Eastman, F. Fliegel, F. Foster, F. Gottheil, H. Gould, W. Heinrichs, N. Jacobs, B. Kachru, Y. Kachru, B. Karsh, C. Kim, F. K. Lehman, B. Nettl, A. Peshkin, A. Perkins, D. Plath, A. Ringer, P. Schran, K. Taira, G. L. Tikku, E. Wolff, G. Yu, L. Zgusta

Associate Professors: W. Archer, R. Chang, C. Cheng, H. Choldin, S. Cohen, S. Douglas, T. Hymowitz, B. Kling, S. Makino, K. Munakata, M. Wagner, M. Weinstein, M. Weinbaum

Assistant Professors: S. Anacker, J. Brukman, L. Crissman, K. Gould, J. Hart, H. Hock, R. Jennings, W. MacDonald, W. Maxwell, J. Peterson, J. Pierson, S. Sato, M. Shorish, K. Southwood, H. Wechsler, P. Wiebe

Graduate Program. The Center for Asian Studies offers a two-year program of language and area courses leading to the Master of Arts in Asian Studies with regional concentrations in East Asia, Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for those intending to proceed to the Ph.D. in a related field and for those preparing for careers not requiring the doctorate. The Center for Asian Studies also administers a graduate minor in Asian studies in cooperation with various departments, allowing a graduate student electing this minor to concentrate on East Asia, Middle East, South Asia, and Southeast Asia, or a combination of two or more of these areas.

Admission and Aid. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois, but final selection is determined by a committee of center faculty. Applicants must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable, it is not required for admission. Those entering without any prior training or experience, however, may be required to take without credit toward the degree such work as the adviser may deem necessary to make up any deficiencies.

University fellowships and teaching assistantships are available on a competitive basis.

Master of Arts. A candidate must complete nine units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to the candidate's regional concentration by passing an appropriate language examination, pass a written examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers.

Minors in Asian Studies. A candidate for a master's degree who elects Asian studies as a minor must earn at least two units of graduate credit in approved courses in at least two departments outside the major department.

A doctoral candidate who elects Asian studies as a minor must earn at least four units of graduate credit in approved courses in at least two departments outside the major department. Also, prior to the completion of course requirements for the degree, the doctoral candidate must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Head of the Department: Icko Iben, Jr.

Correspondence and Information: Head, Department of Astronomy, University of Illinois at Urbana-Champaign, 103 Observatory, Urbana, Illinois 61801

FACULTY

Professors: W. D. Arnett, I. Iben, Jr., G. W. Swenson, Jr., J. W. Truran, S. P. Wyatt, K. M. Yoss
Associate Professors: J. H. Cahn, J. R. Dickel, J. B. Kaler, E. C. Olson, W. D. Watson
Assistant Professors: P. S. Hoover, M. R. Nelson, J. C. Webber

Graduate Programs. The Department of Astronomy offers graduate work leading to the Master of Science and Doctor of Philosophy.

Admission and Aid. An admission average of at least 4.0 is required. Additional normal entrance requirements are a bachelor's degree in astronomy, physics, electrical engineering, physical chemistry, or mathematics, and a one-year course in descriptive astronomy. The award of financial assistance normally requires an average higher than 4.5.

Master of Science. Eight units of study in graduate courses are required. There are no thesis or foreign language requirements. The eight units of course work may be distributed as follows: all units taken in astronomy; or two units selected from approved courses in physics, two units from approved courses in mathematics and electrical engineering, with the remaining units selected from astronomy courses.

Doctor of Philosophy. A student continuing beyond the master's degree takes eight additional units of study and demonstrates a reading knowledge of two foreign languages. After passing both a written and an oral preliminary examination, the student then embarks upon an investigation which culminates in a doctoral dissertation and at least one paper suitable for publication in a recognized professional journal.

ATMOSPHERIC SCIENCES

Chairman of the Graduate College Committee on Atmospheric Science and Meteorology: R. O. Simmons
Correspondence and Information: Y. Ogura, Director, Laboratory for Atmospheric Research, 5-113 Coordinated Science Laboratory Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801

FACULTY

Professor: Y. Ogura
Associate Professor: M. A. Geller
Assistant Professors: H.-R. Cho, J. M. Lewis, M.-K. Mak, S.-T. Soong, R. B. Wilhelmson

Graduate Programs. A graduate program leading to the Master of Science and Doctor of Philosophy in Atmospheric Sciences is offered under the auspices of the Graduate College Committee on Atmospheric Science and Meteorology. These degree programs are designed for students interested in research and application in many aspects of atmospheric sciences. The areas of research include the earth's global circulation, numerical weather prediction, dynamics of tropical circulations, meso- and small-scale circulations, planetary boundary layer, dynamics of the upper atmosphere, and atmospheric diffusion processes.

Admission and Aid. Applications for admission to this program must satisfy the general requirements for admission to the Graduate College (page 16) and must have an admission average of at least 4.0. Applications of students with an admission average below 4.0 but above 3.75 are considered, and applicants may be admitted under special circumstances. Previous training in the atmospheric sciences is not essential. It is strongly recommended, however, that students who intend to study for advanced degrees in the atmospheric sciences know the fundamentals of classical physics and applied math-

ematics. For qualified students, financial assistance is available in the form of fellowships, assistantships, and tuition and fee waivers.

Master of Science. A candidate for the Master of Science must complete eight units of credit. A written thesis, involving from one to two units of credit, is a part of this requirement. Further information on exact degree requirements can be obtained through the Laboratory for Atmospheric Research.

Doctor of Philosophy. All candidates for the Ph.D. must satisfy the general requirements described on page 29 and are required to pass a qualifying examination on the basic principles of atmospheric science, a preliminary examination based on a written thesis proposal, and a final examination based on the completed thesis. Course requirements and these examinations are described in detail in a pamphlet which may be obtained from the Laboratory for Atmospheric Research. Experience has shown that this doctoral program may be completed by a full-time student in four years beyond the bachelor's degree.

BUSINESS ADMINISTRATION

Head of the Department: Kenneth P. Uhl
Correspondence and Information: Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: A. Andreasen, N. M. Bedford, R. N. Corley, P. M. Dauten, R. V. Evans, R. Ferber, R. M. Hill, M. G. Jones, L. R. Pondy, H. M. Schoenfeld, J. N. Sheth, J. L. Simon, S. Sudman, W. E. Thomas, K. P. Uhl, W. Zangwill
Associate Professors: R. J. Arnould, R. L. Black, D. M. Gardner, H. Hinomoto, D. M. Roberts, K. M. Rowland
Assistant Professors: B. J. Calder, J. K. Johansson, V. P. Marathe, H. W. Melton, G. R. Oldham, W. Rom, G. Salancik, B. M. Staw, R. J. Stern, F. W. Winter, P. Wright

Graduate Programs. The Department of Business Administration offers graduate programs leading to the degrees of Master of Business Administration, Master of Science in Business Administration, and Doctor of Philosophy in Business Administration. The department also offers, in cooperation with other departments and colleges, a variety of interdisciplinary programs leading to such combined degrees as the Master of Business Administration and Juris Doctor.

Admission and Aid. The minimum admission requirement is a grade-point average of 4.0 on the last two years of course work for either master's degree, 4.25 for the doctoral degree, and an acceptable score (550) on the Admission Test for Graduate Study in Business, administered by the Educational Testing Service, Princeton, New Jersey 08540. Applicants with extenuating circumstances should contact the Director of Graduate Studies in Business Administration. Persons seeking admission should have completed one year of college-level courses in calculus or be prepared to remove this deficiency immediately upon entering the program. In general, admission is based on a person's (1) previous academic accomplishment; (2) demonstrated potential as indicated by performance on the Admission Test for Graduate Study in Business; (3) statement of educational goals; and (4) letters of recommendation from professors, supervisors, or colleagues. Financial aid is available to a limited number of students in the form of fellowships and assistantships.

Master of Business Administration. The Master of Business Administration is designed to meet the educational needs of persons preparing for administrative positions. It encourages the development and application of fundamental concepts and methods in the

quantitative, social, and behavioral sciences to problems in administrative decision making. Superior students without a background in business can achieve a rigorous educational background in administration within two years or less by completing sixteen units of course work. Persons with a background in business usually can graduate with twelve units of course work. The program may be started at the beginning of any semester, including the summer term.

Three areas of study in quantitative methods, behavioral science, and economics make up the required program core and four courses covering marketing, introduction to production, financial management, and managerial accounting and control constitute the functional areas. The core courses introduce and integrate the contributions of the quantitative, social, and behavioral sciences to the functional areas. Two additional courses, in law and business policy and in business policy and planning, provide an overview of the legal environment and policy and planning.

Master of Science in Business Administration. The Master of Science in Business Administration program offers a ten- to twelve-unit master's program for persons with an undergraduate education in business who desire additional training in a specialized area. The focus is on preparation for advanced study in the doctoral program or for a research-oriented position. The course work can usually be completed in one to one and one-half years.

The program core for this degree is the same as for the Master of Business Administration. Four courses constitute the major area of specialization. The areas available include management science, organizational behavior, management information systems, marketing, international business operations, and administration. Two courses constitute a minor area. They can be two independent research courses, or can be chosen from the list of majors or from related areas outside the department or college. In place of the two courses, a thesis may be prepared.

Doctor of Philosophy in Business Administration. This program offers an in-depth education in teaching and research in selected areas of business and administration. The Doctor of Philosophy in Business Administration identifies the recipient as a professional who is concerned with the purposeful search for knowledge. Doctoral students can specialize in management science, marketing, organizational behavior, management information systems, production, administration, and other specialized areas. The program is flexible and adaptable to individual needs; it provides a creative learning environment in which students assess their knowledge and skills in consultation with faculty members and design programs which will fulfill their unique needs and enable them to effectively pursue their personal goals.

Each student's program will entail sufficient study and preparation to achieve the following: (1) Competence in behavioral science, operations research, research methodology, and statistics. These topics constitute the *core* of the program. (2) An in-depth expertise in a *major area.* (3) Expertise in at least one area in addition to the chosen major area. This *minor area* may be selected from within or from outside the department. (4) Teaching competence. (5) Research or problem solving competence.

For persons entering the program from an undergraduate program, the minimum requirements are sixteen course units (one unit equals four semester hours or six quarter hours) and eight dissertation units. Persons entering with a master's degree in business generally will need a minimum of eight course units and eight dissertation units.

Competency is determined by a series of comprehensive written examinations. Following successful completion of all course work and comprehensive examinations, the student formally proposes a dissertation topic at a public colloquium. The final program requirement is the successful oral defense of the dissertation. This program usually is completed in three to four years.

Master of Business Administration and Juris Doctor Program. This program, leading to the M.B.A. and J.D. degrees in four years, is designed to afford persons the opportunity to obtain training for careers in which administration and law overlap to a considerable extent. To enter the program, a person must apply separately and be admitted

to the College of Law as well as the Department of Business Administration of the College of Commerce and Business Administration. The policies of each college with respect to degree requirements, grades, examinations, and other academic requirements for graduation are applicable.

During his first two years, the student takes the first-year law curriculum in one year and the first-year business administration curriculum in the other. The student takes courses in both colleges his third and fourth years.

As a minimum program, a student would have to take seventy-four hours of law courses and twelve units (or forty-eight semester hours) of business administration courses.

CERAMIC ENGINEERING

(Including Ceramics)

Head of Department: A. L. Friedberg

Correspondence and Information: A. L. Friedberg, Head, Department of Ceramic Engineering, University of Illinois at Urbana-Champaign, 204 Ceramics Building, Urbana, Illinois 61801

FACULTY

Professors: C. G. Bergeron, S. D. Brown, R. L. Cook, A. L. Friedberg, J. A. Nelson, W. S. Williams

Associate Professors: R. L. Berger, R. C. Buchanan, D. R. O'Boyle, T. A. Willmore, G. P. Wirtz

Assistant Professor: G. H. Kenner

Graduate Programs. The Department of Ceramic Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Ceramics and the Master of Science and Doctor of Philosophy in Ceramic Engineering. The program in ceramic engineering involves instruction and research related to applied science and engineering concerning ceramic materials. Candidates in this area of concentration are usually those who have completed an undergraduate degree in engineering. The prerequisite for graduate study is proficiency in the undergraduate courses required for the Bachelor of Science in Ceramic Engineering at the University of Illinois, or acceptable equivalents. Ceramics encompasses a program more concerned with basic materials science, and candidates may come from nonengineering disciplines such as chemistry, physics, or geology.

Master of Science. The candidate for the Master of Science in Ceramics or Ceramic Engineering must complete a minimum of eight units of graduate work, including a thesis.

Doctor of Philosophy. Candidates for the Doctor of Philosophy in Ceramics or in Ceramic Engineering are required to complete first the master's thesis or give equivalent evidence of research experience. They must also pass the departmental qualifying examination. There is no foreign language requirement. Minor requirements are satisfied by courses selected in chemistry, physics, mathematics, geology, or other engineering disciplines.

Students majoring in chemistry, physics, engineering, and in certain other departments may take sole or second minors in ceramics or ceramic engineering.

Admission and Aid. Applicants who have completed or are finishing an undergraduate program should have an admission average of at least 3.75. If the applicant has completed some graduate work, that record also will be taken into consideration. Financial aid in the form of fellowships, and teaching or research assistantships is available on a competitive basis for both new and continuing students.

CHEMICAL PHYSICS

Head of the Department of Chemistry: H. S. Gutowsky
Head of the Department of Physics: Ralph O. Simmons
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head of the Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, Urbana, Illinois 61801; students with undergraduate degrees in physics should direct inquiries and applications to the Head of the Department of Physics, University of Illinois at Urbana-Champaign, 215 Physics Building, Urbana, Illinois 61801

Graduate Program. Fundamental research on many properties of molecular and solid state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department of the University. A program leading to the Doctor of Philosophy in Chemical Physics makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Students may make use of the facilities available in both the School of Chemical Sciences and the Department of Physics.

Admission and Aid. Applicants to be considered for admission should have undergraduate degrees in chemistry or physics, an admission average of at least 4.0, and a strong background in the major field of chemistry or physics, with more than the usual training in the other area. Those who received their degrees in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degrees in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

Doctor of Philosophy. In addition to taking a series of appropriate courses, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). Research for the dissertation is performed under the direction of staff members who are currently active in chemical physics. Many of these staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students from physics, chemistry, metallurgy, ceramic engineering, electrical engineering, and other related departments, who have common interests in materials science. It promotes interdisciplinary interactions, fresh viewpoints, and a creative and stimulating environment. (See page 13.)

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School of Chemical Sciences: H. S. Gutowsky
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, Urbana, Illinois 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering, and Chemistry. Study programs leading to the degrees of Master of Science and Doctor of Philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of

the three departments, and yet retain the advantages of a common approach to overlapping concerns. Support for graduate training is available in the form of assistantships and fellowships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department, or from the director of the School of Chemical Sciences.

Biochemistry

Head of the Department: Lowell P. Hager
Correspondence and Information: Head, Department of Biochemistry, University of Illinois at Urbana-Champaign, 415 Roger Adams Laboratory, Urbana, Illinois 61801

FACULTY

Professors: H. E. Conrad, I. C. Gunsalus, L. P. Hager, N. J. Leonard, R. F. Nystrom, G. Weber
Associate Professors: J. M. Clark, Jr., R. L. Switzer
Assistant Professors: W. O. McClure, R. I. Gumport, G. W. Ordal, P. G. Schmidt, J. Robinson, D. R. Storm, O. C. Uhlenbeck, J. G. Wetmur

Graduate Programs. The Department of Biochemistry offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees.

Admission and Aid. Students are considered for admission with full standing if they hold an undergraduate degree in a physical or natural science area and have an admission average of at least 4.0. Borderline grade-point averages will be considered and may be admitted in some cases. Applicants are expected to have completed a full year each of organic and physical chemistry at the undergraduate level and to have taken the equivalent of a strong minor program in the life sciences area. Students whose undergraduate training is deficient in one or more of these areas can be admitted with the provision that the deficiencies will be removed in an early phase of their graduate training. Financial aid is available to virtually all students who are accepted as degree candidates in the Ph.D. program. This aid is available in the form of National Institutes of Health traineeships, fellowships, and teaching and research assistantships.

Master of Science. The Master of Science in Biochemistry may be completed with or without a thesis. A course work master's degree requires a minimum of two full-time semesters and involves eight units of formal lecture and laboratory course work. A Master of Science degree with thesis usually requires a minimum of three semesters work, in which three of the eight required units may involve thesis research.

Doctor of Philosophy. Qualification for the Ph.D. program in biochemistry involves passing a research qualifying exam within the first eighteen months of residency and requires the successful completion of a series of written cumulative exams. A reading knowledge of one foreign language (French, German, or Russian) is required for the degree. A thesis based on original research must be presented to a review committee at least two weeks prior to the final examination. The final examination is limited to a defense of the thesis research topic. The Ph.D. degree program usually takes three to five years for completion. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Chemical Engineering

Head of the Department: J. W. Westwater
Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois at Urbana-Champaign, 113 Roger Adams Laboratory, Urbana, Illinois 6180

FACULTY

Professors: H. G. Drickamer, C. A. Eckert, T. J. Hanratty, R. A. Schmitz, J. W. Westwater
Associate Professors: J. L. Hudson, R. L. Sani
Assistant Professors: R. C. Alkire, A. A. Kozinski

Graduate Programs. The Department of Chemical Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy. Those interested should write to the address above for application materials and a departmental brochure which gives greater detail on programs, offerings, admission, degree requirements, and financial aid.

Admission and Aid. Candidates for advanced degrees in chemical engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois, and an admission average of 4.0. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with deficiencies to be removed to the extent prescribed by their advisers. Financial aid is available in the form of fellowships, teaching assistantships, and research assistantships.

Master of Science. Requirements for the Master of Science in Chemical Engineering include eight units of graduate credit and a thesis. At least five of these units must be in courses other than thesis, and they must include at least two graduate-level chemical engineering courses.

Doctor of Philosophy. Requirements include twenty-four units of graduate credit, satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test normally taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: H. S. Gutowsky
Associate Head: J. P. Hummel
Correspondence and Information: Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, Urbana, Illinois 61801

FACULTY

Professors: D. E. Applequist, P. Beak, T. L. Brown, D. Y. Curtin, R. S. Drago, H. G. Drickamer, W. H. Flygare, H. S. Gutowsky, G. P. Haight, Jr., J. P. Hummel, J. Jonas, H. A. Laitinen, N. J. Leonard, H. V. Malmstadt, R. A. Marcus, J. C. Martin, K. L. Rinehart, S. G. Smith, H. R. Snyder, G. D. Stucky, P. E. Yankwich
Associate Professors: R. L. Belford, R. M. Coates, I. C. Paul, W. H. Pirkle, D. H. Secrest, J. T. Yardley
Assistant Professors: E. K. Barefield, D. Chandler, W. T. Ford, L. R. Faulkner, R. B. Gennis, D. N. Hendrickson, J. A. Katzenellenbogen, J. D. McDonald, D. F. S. Natusch, P. G. Schmidt, J. R. Shapley, O. C. Uhlenbeck, J. G. Wetmur

Graduate Programs. The degrees offered in chemistry are Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. Attention is also called to a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 54) and to the programs in Biophysics (see page 95) and in Biophysical Chemistry (see page 57).

Admission and Aid. Students who have fulfilled the usual undergraduate course requirements, including at least twenty-five properly distributed semester hours in chemistry, and who have an admission average of at least 4.0, may be considered for admission to the Graduate College in any of the programs offered by the Department of Chemistry. Applications of students with admission averages below 4.0 but above 3.75 may be admitted in some cases. Students who have completed graduate work in chemistry at another institution may be considered for admission if they have averages of 4.0 in both undergraduate and graduate work, or if they have earned a 4.25 average in at least eight units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the Teaching of Chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree. Students in any of the programs are eligible to apply for financial aid which is available in the form of fellowships, teaching assistantships, and research assistantships.

The Teaching of Chemistry Program. Candidates for the Master of Science in the Teaching of Chemistry must earn four units of credit in chemistry, two units in education, and two units of electives in either education or physical science. The two units in education consist of courses in the history and philosophy of education and educational psychology. The courses in chemistry and the electives, which must normally give graduate credit, must be selected with the approval of the adviser. Questions concerning the Teaching of Chemistry Program can be addressed to Professor D. H. Secrest, 155 Noyes Laboratory.

Master's Programs in Chemistry. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A thesis is optional.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialties including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. Besides completing formal course work, the students are required to pass a series of written cumulative exams, demonstrate a reading knowledge of a foreign language, and submit a thesis on original research which is defended at a final oral exam. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering)

Head of the Department: C. P. Siess

Correspondence and Information: Head, Department of Civil Engineering, University of Illinois at Urbana-Champaign, 1114 Civil Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: W. C. Ackermann, A.H-S. Ang, J. E. Baerwald, E. J. Barenberg, J. W. Briscoe, A. B. Chilton, V. T. Chow, M. T. Davisson, D. C. Drucker, R. S. Engelbrecht, R. A. Eubanks, B. B. Ewing, W. L. Gamble, W. J. Hall, J. D.

Haltiwanger, W. W. Hay, A. J. Hendron, M. Herrin, E. R. Holley, H. O. Ireland, H. M. Karara, C. E. Kesler, N. Khachaturian, R. W. Larimore, T. E. Larson, Jon C. Liebman, J. W. Melin, W. H. Munse, J. P. Murtha, N. M. Newmark, J. T. O'Connor, J. E. Pearson, R. B. Peck, J. T. Pfeffer, A. R. Robinson, M. O. Schmidt, W. C. Schnobrich, L. R. Shaffer, C. P. Siess, G. K. Sinnamon, M. A. Sozen, J. E. Stallmeyer, M. R. Thompson, T. H. Thornburn, R. N. Wright

Associate Professors: R. L. Berger, E. L. Bidwell, L. T. Boyer, E. J. Cording, G. Gurfinkel, F. V. Lawrence, L. A. Lopez, W. H. C. Maxwell, V. J. McDonald, G. Mesri, R. J. Mosborg, V. L. Snoeyink, J. J. Stukel, W. H. Walker, H. G. Wenzel, K. W. Wong, B. C. Yen

Assistant Professors: E. D. Brill, E. S. Chian, M. I. Darter, B. J. Dempsey, E. J. Kannel, H. V. Leland, O. E. Lev, Judith S. Liebman, J. F. McNamara, B. Mohraz, S. L. Paul, D. A. W. Pecknold, Q. L. Robnett, M. J. Semmens, W. Tang, G. Tauxe, Y. K. Wen, J. F. Young

Graduate Programs. The Department of Civil Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Civil Engineering and in Environmental Engineering in Civil Engineering.

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the following general fields: air pollution, computer-aided design, construction management, structural analysis and design, foundations, earthquake engineering, environmental engineering in civil engineering, geodesy, highway and materials, hydraulics and hydrology, liquid-solid waste management, materials engineering, nuclear shielding, photogrammetry, soil and rock mechanics, structural mechanics, probability and stochastic processes, systems engineering, transportation, and water resources. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission and Aid. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois, provided the applicant's preparation is appropriate to advanced study in his chosen major field, and his admission average is at least 4.0. Under certain conditions, applicants with averages less than 4.0 and applicants from schools with different grading systems may be considered if their averages are equivalent to or higher than 3.75, and evidence is submitted indicating that the applicant's ability is not appropriately measured by the grades submitted.

Financial assistance is available to promising graduate students through fellowships, traineeships, teaching and research assistantships, tuition and fee waivers, and loans. For additional information, see the department pamphlet "Graduate Study and Research in Civil Engineering and in Environmental Engineering in Civil Engineering."

Master of Science. A master's program may be completed in one full-time academic year of study. A candidate for the master's degree must complete at least eight units of graduate work with satisfactory grades with a thesis or nine units without a thesis. A candidate for the master's degree must spend at least two semesters in residence and must earn at least half of the required units while in residence. Under certain conditions, a student holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time.

Doctor of Philosophy. The degree of Doctor of Philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. In accordance with Graduate College regulations, two of the three stages must be completed in residence. The major area of specialization encompasses courses and research which are closely related but the courses need not necessarily be offered by a single major department. Several options are available for meeting the language requirements of the department. The candidate must demonstrate a capacity for independent research by preparing an original thesis on a topic within the major field of study, and the candidate must pass both formal preliminary and final examinations.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Head of the Department: MIROSLAV MARCOVICH
Director of Graduate Study: MARK NAOUMIDES
Correspondence and Information: Director of Graduate Study, Department of the Classics, University of Illinois at Urbana-Champaign, 4072 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. J. BATEMAN, J. L. HELLER, M. MARCOVICH, M. NAOUMIDES, R. P. OLIVER, W. R. SCHOEDEL, L. WALLACH
Associate Professors: H. JACOBSON, J. K. NEWMAN, R. T. SCANLAN
Assistant Professors: H. L. ALLEN, D. F. BRIGHT, V. K. ROBBINS, D. J. TAYLOR

Graduate Programs. The Department of the Classics offers graduate work leading to the Master of Arts and the Doctor of Philosophy. Although the graduate program is designed to educate students in breadth and depth in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including Greek and Latin patristics, mediaeval Latin, and Neo-Latin); classical archaeology; or, in conjunction with the appropriate department, comparative literature, ancient history, and ancient philosophy. A brochure describing the current *Regulations Governing Candidates for Advanced Degrees* and special programs for prospective secondary school or junior college teachers can be obtained from the department office.

Admission and Aid. Applicants for admission to graduate study in the classics must ordinarily present at least twenty hours of college-level work in either Greek or Latin. Students intending to work toward the Ph.D. must be adequately prepared in both languages. A reading knowledge of German is essential and of French or Italian highly desirable. Previous study of history and philosophy is especially recommended. The admission average is 4.0; applicants with averages below 4.0 but above 3.75 may be considered and admitted in some cases. Financial aid is ordinarily available in the form of fellowships, research or teaching assistantships, and waivers of tuition and fees.

Master of Arts. The Master of Arts may be taken in the Classics, Greek, Latin, or in the teaching of Latin. Candidates for this degree must complete eight units of course work of which at least four must be in the major subject (Greek or Latin); the other four units may be in courses taken in classics or in acceptable subjects in other departments. See page 28 for special requirements in the fifth-year teaching programs.

Doctor of Philosophy. Students may be admitted to the program leading to the Ph.D. upon the completion of a Master of Arts in the Classics or the equivalent. The Doctor of Philosophy is given only in classical philology which requires advanced course work in both Greek and Latin beyond the master's level.

COMMUNICATIONS

Dean of the College of Communications: THEODORE PETERSON
Chairman of the Graduate Committee in Communications: JAMES W. CAREY
Correspondence and Information: Chairman, Graduate Committee in Communications, University of Illinois at Urbana-Champaign, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: A. M. Barban, J. W. Carey, J. B. Casagrande, S. W. Dunn, M. E. Fishbein, J. W. Jensen, H. Maclay, R. Merritt, H. L. Mueller, C. E. Osgood, T. Peterson, J. H. Schacht, R. J. Simon, N. Wedding, N. Wiggins
Associate Professors: W. K. Archer, T. Guback, J. G. Delia
Assistant Professors: W. F. Brewer, E. Douglass, J. E. Erickson, A. L. Kreiling, D. P. Mullally, K. B. Rotzoll

Graduate Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communications and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinguistics. The program applies the methods and disciplines of the social sciences, supported by the humanities, fine and applied arts, and natural sciences, to the basic problems of human communications. It is intended for students who plan careers in teaching such communication subjects as journalism, radio-television, and psycholinguistics; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communication effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Admission and Aid. Students are considered for admission who will hold by the time of their entry into the program a bachelor's *or* master's degree with an admission average of 4.0. A broad background in the social sciences or humanities is expected. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Doctor of Philosophy. Students working toward a Ph.D. normally require from three to five years to complete their work. A full-time student entering the program directly upon receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a dissertation. Full-time students entering with a master's degree should expect to take a minimum of one year of course work prior to embarking on the dissertation. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the Departments of Journalism, Radio and Television, or Advertising, or in one of the several departments in the social sciences. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the dissertation.

COMPARATIVE LITERATURE

Director of the Graduate Program: Herbert Knust
Correspondence and Information: Director of Graduate Studies, Program in Comparative Literature, University of Illinois at Urbana-Champaign, 2070 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: A. O. Aldridge, W. Höllerer, F. Jost, H. Knust, R. Montano
Assistant Professor: Barbara Smalley

Graduate Programs. The program leading to the degrees of Master of Arts and Doctor of Philosophy in Comparative Literature is designed to make possible a systematic study of subjects and problems common to several literatures. Its purpose is to enable students

who have greater than average linguistic competence and preparation to explore the theory of literature and criticism; the interrelations of several literatures; the main currents, periods, and movements in literary history; the development of literary themes and types; and relations between literature and other media. This interdepartmental program is assisted by an advisory committee consisting of representatives of the departments of modern languages and literatures and classics. The student's program of study is supervised by an adviser from the Program in Comparative Literature. The journal *Comparative Literature Studies* is sponsored by the program.

Admission. A student entering the program should have an undergraduate major in English, classics, or foreign languages with an admission average of at least 4.0. Majors in history and philosophy may also be accepted with the special consent of the adviser.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages as well as in English. Some knowledge of Latin (or Greek) is highly recommended; Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or neoclassicism. Competency in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the Program in Comparative Literature with the assistance of an expert in the language concerned. This choice is intended to provide for exotic languages which may not be taught in regular departments.

The candidate must also acquire eight units of credit including a course in theory of literature and two other seminars in comparative literature taught by members of the comparative literature faculty. The other five units must be taken in two or three national literatures in a distribution approved by the adviser; at least five of the eight units must be taken in courses at the 400 level. The candidate must also pass a written examination, based on a reading list, which is designed to test knowledge of literary history as well as ability to interpret a literary or critical text. A thesis is optional.

Doctor of Philosophy. A candidate for the Doctor of Philosophy must fulfill the general requirements of the Graduate College including those specified above for the master's degree. Competency must be demonstrated in at least three foreign languages as well as in English. These three languages must coincide with those vital to the student's dissertation and area of specialization. The candidate must choose at least four units of work from comparative literature seminars taught by members of the comparative literature faculty. Four additional units of work at the 400 level must be taken in courses regularly offered by the literature departments; among these, courses crosslisted with comparative literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. The student must also select a period of major interest, and be responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be medieval, Renaissance, neoclassical and Enlightenment, or modern (nineteenth and twentieth centuries). A preliminary examination, a four-part written examination based on his individual program, plus an oral examination must be passed and the candidate must present a dissertation embracing several national literatures.

COMPUTER SCIENCE

Head of the Department: James N. Snyder
Chairman of the Committee on Fellowships, Assistantships and Admissions: W. J. Kubitz
Correspondence and Information: J. N. Snyder, Head of the Department of Computer Science, University of Illinois at Urbana-Champaign, 252 Digital Computer Laboratory, Urbana, Illinois 61801

FACULTY

Professors: C. W. Gear, D. B. Gillies, D. Kuck, C. L. Liu, S. Muroga, T. A. Murrell, J. Nievergelt, W. J. Poppelbaum, S. R. Ray, J. E. Robertson, D. L. Slotnick, J. N. Snyder

Associate Professors: M. Faiman, H. G. Friedman, Jr., R. S. Michalski, P. E. Saylor

Assistant Professors: E. K. Bowdon, D. F. Cudia, W. J. Hansen, W. J. Kubitz, M. D. Mickunas, R. G. Montanelli, Jr., J. R. Phillips, E. M. Reingold, A. H. Sameh, D. S. Watanabe, T. R. Wilcox

Graduate Programs. The Department of Computer Science offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. There is opportunity for specialization in analysis of algorithms and theory of computation, circuit design, combinatorics, computer aided instruction, computer applications in physical sciences, computer networks, computer organization, digital computer arithmetic, information processing and hardware displays, information retrieval, languages, numerical analysis, pattern recognition, software systems, and switching and automata theory. A degree of Master of Science in the Teaching of Computer Science is also offered.

Admission and Aid. The admission average is 4.0. Applicants with an average below 4.0 but above 3.75 are considered as space is available. Course prerequisites are twenty semester hours of computer science, electrical engineering, mathematics, or physics, including courses in three of these four areas: computer organization and programming, numerical analysis, computer hardware, or logical design.

A student with deficiencies may still be admitted for graduate work, but will be expected to remove these deficiencies in the first year. Because of the interdisciplinary nature of computer science, the department will consider applications from students with backgrounds other than those listed above.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. The student must complete eight units of satisfactory course work, with at least four of these from a list of computer science courses subject to the approval of the adviser. A grade-point average of 4.0 must be maintained for degree certification. Three of the eight units must be in 400-level computer science courses. A qualifying examination as described below must also be passed.

Doctor of Philosophy. The student must pass the qualifying examination described below. This examination is identical to that demanded for the M.S., but substantially better performance is required.

A reading knowledge of one foreign language must be demonstrated. Students may satisfy reading proficiency by either taking a direct examination administered by the language department, receiving an acceptable score on the Educational Testing Service test in the language, obtaining grades of A or B in the language reading course for graduate students, submitting evidence of having passed a two-year undergraduate sequence in the language, or submitting evidence of having passed a four-year high school sequence in the language. Any language for which appropriate courses or examinations exist at this University will be acceptable. A student whose native language is not English will be regarded as having satisfied the foreign language requirement upon passing the standard English language requirement which is necessary for admission to the Graduate College.

Qualifying Exam. A qualifying exam is given each semester. A graduate student must take this after completing five graduate units toward an M.S. degree; if the student has entered with a master's degree, it will be taken in the second semester. The exam covers four areas: programming and languages, numerical analysis, logical design, and hard-

ware. The master's candidate must pass three areas; the Ph.D. candidate must pass all four and achieve a high pass in one area. A student may retake the exam once in those areas in which he fails.

Master of Science in the Teaching of Computer Science. The student must complete eight units of satisfactory course work consisting of one unit in educational psychology, one unit in history and philosophy of education, four units of specified computer science courses, and a two-unit elective sequence either in computer science or an allied discipline. Each student (under the supervision of the faculty adviser) will be required to complete a teaching project in computer science. The objective of this curriculum is to prepare competent and well-qualified teachers of computer science for junior colleges, trade schools, vocational schools, and high schools. Note, however, that teaching in high schools requires state certification. See page 28 for details.

DAIRY SCIENCE

Head of the Department: K. E. Harshbarger
Correspondence and Information: Department of Dairy Science, University of Illinois at Urbana-Champaign, 315 Animal Sciences Laboratory, Urbana, Illinois 61801

FACULTY

Professors: M. P. Bryant, C. L. Davis, K. E. Harshbarger, R. L. Hays, B. L. Larson, J. R. Lodge
Associate Professors: J. H. Byers, C. N. Graves, S. L. Spahr
Assistant Professors: D. E. Bauman, M. Grossman, J. L. Robinson

Graduate Programs. The Department of Dairy Science offers a program of graduate study leading to the Master of Science and Doctor of Philosophy. This program offers advanced work in several fields of specialization in dairy science including biochemistry; genetics; management; microbiology; nutrition; and physiology of lactation and reproduction. Each graduate student must select, in consultation with the head of the department, a faculty adviser and one of the fields of specialization.

Admission and Aid. For admission to full standing, an applicant's admission average must be at least 3.75. In addition, the student must demonstrate reasonable proficiency in physical and biological sciences at the undergraduate level and an interest in agricultural sciences.

A limited number of fellowships and several graduate assistantships are available on a competitive basis. Graduate assistantships offer students an opportunity to obtain teaching and/or research experience. Appointments are made for a twelve-month period, including one month of vacation.

Master of Science. A candidate for the Master of Science must complete a minimum of eight units of course work, including one-half unit of seminar and two units of thesis research. A comprehensive examination concerning the thesis and the general field of dairy science is required.

Doctor of Philosophy. A candidate for the Doctor of Philosophy must complete the M.S. degree, seven units of advanced courses, one unit of seminar, and eight units of thesis research. The advanced course requirements depend upon the area of study in which the student specializes and upon career objectives. Information concerning such requirements may be obtained from the departmental office. The doctoral program includes a preliminary examination, a dissertation covering the thesis research, and a final examination.

DANCE

Head of the Department: Oliver J. Kostock
Correspondence and Information: Department of Dance, University of Illinois at Urbana-Champaign, 4-305 Krannert Center for the Performing Arts, Urbana, Illinois 61801

FACULTY

Associate Professors: B. Blossom, O. J. Kostock, W. W. Ward, Jr.

Graduate Program. The Department of Dance offers a program of graduate study leading to the Master of Arts. This program offers advanced work in choreography; technique; production; history; philosophy; and pedagogy, with emphasis on the related fields of art, music, and theatre.

Admission and Aid. A student who wishes to be considered for admission to graduate study in dance must have an admission average of 3.5 and have previous work in art, music, theatre, and at least eight semester hours in dance. Applicants lacking undergraduate credits in dance may substitute certified experience which is determined to be the equivalent of eight semester hours.

The Department of Dance reserves the right to accept for advanced study only those students whose preparation in dance has been obtained in certain approved institutions. Preference is given to full-time students who will be active degree candidates. Financial aid is available to a very limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. A candidate for the Master of Arts must spend at least two semesters and a summer session in residence. Of the eight units required for the degree, a minimum of four must be in dance or, with the approval of the faculty adviser, in dance and such related areas as art, music, and theatre. Required courses in dance will be determined on the basis of the candidate's background. Two additional units are required outside the area of dance, art, music, and theatre. The remaining two units are for the presentation of an acceptable thesis and the accompanying noncredit seminar. The thesis may be waived with the approval of the adviser, but in lieu thereof the candidate must submit two units of course work and a presentation of acceptable dances choreographed and staged by the candidate.

Not later than midpoint in the student's program, his work is reviewed to determine his status in terms of progress, ultimate completion, and awarding of the degree. The Department of Dance may extend the residence requirement or increase the total requirements at this or any other time, if such action seems warranted.

ECONOMICS

Chairman of the Department: P. T. Hartman
Correspondence and Information: Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: V L. Bassie, R. Brandis, H. J. Brems, J. F. Due, R. Ferber, D. P. Flanders, H. Folk, M. Frankel, F. M. Gottheil, P. T. Hartman, A. J. Heins, D. R. Hodgman, G. G. Judge, W. W. McMahon, J. R. Millar, D. W. Paden, J. B. Parrish, J. D. Phillips, R. W. Resek, P. Schran, F. R. Shupp, J. L. Simon, C. M. Sprenkle, K. Taira, T. Takayama, P. J. Wells
Associate Professors: R. J. Arnould, R. W. Gillespie, J. H. Leuthold, L. D. Neal, R. N. Schoeplein, J. Scoville, S. W. Steinkamp, P. Uselding, H. F. Williamson, T. A. Yancey

Assistant Professors: D. G. Bagby, A. I. Duchan, M. A. Ferber, T. S. Friedland, W. E. Hendricks, R. Husby, R. J. Parker, D. J. Poirier, R. Vandendries

Graduate Programs. The Department of Economics offers graduate work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. The candidate for an advanced degree may specialize in the following fields: economic theory; history of economic thought; monetary theory and policy; public finance and taxation; growth and development; international economics; labor economics; economic history; comparative economic systems; econometrics; urban and regional economics; industrial organization; and mathematical economics.

Admission and Aid. The applicant for admission in graduate study in economics must hold a bachelor's degree and have at least a 4.0 admission average. Under special circumstances, students with averages between 3.75 and 4.0 are considered. A higher average is usually necessary to be eligible for financial aid. The department requires that the results of the Graduate Record Examination accompany the application for admission. Financial aid is available to a limited number of qualified students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts or Master of Science. The master's degree may be obtained with or without a thesis. Basic requirements for both programs include two units of theory, one unit of statistics or demonstration of proficiency, and one unit in the areas of either history of economic thought or economic history, or demonstration of proficiency. The A.M. program includes four additional units, two of which must be thesis work. The M.S. program requires twelve units of work, including, in addition to the four units of basic requirements described above, one field of specialization, two units, plus six additional units of which three units must be in economics and three are electives.

Doctor of Philosophy. The following requirements must be met: three units of theory; one each of history of economic thought and economic history; one unit of statistics or demonstration of proficiency; three additional fields, two of which must be in economics; and an additional eight units of dissertation work to bring the total to twenty-four units. The student is expected to have had at least two semesters of calculus and one of linear algebra. The candidate is required to pass a written preliminary examination in theory no later than the beginning of the fourth semester and to pass written examinations in the remaining fields by the sixth semester. The candidate is expected to give a brief oral defense of the dissertation proposal and to pass an oral final examination covering the research. This is a three-year program of study beyond the bachelor's degree for a student having adequate background in economics and mathematics and devoting *full time* to graduate work. An additional year or more may be necessary for those holding part-time assistantships.

EDUCATION

(Including Administration, Higher and Continuing Education, Educational Psychology, Elementary Education, History and Philosophy of Education, Secondary Education, Special Education, and Vocational and Technical Education)

Dean of the College of Education: J. Myron Atkin
Coordinator of Graduate Study: William D. Johnson
Correspondence and Information: Coordinator of Graduate Study, College of Education, University of Illinois at Urbana-Champaign, 110 Education Building, Urbana, Illinois 61801

FACULTY

Professors: L. M. Aleamoni, R. C. Anderson, J. M. Atkin, S. W. Bijou, P. G. Braunfeld, H. S. Broudy, J. H. Burnett, J. R. Burnett, R. A. Burnham, R. J. Colwell, C. B. Cox, R. B. Davis, D. J. Delaney, T. Denny, D. Durkin, J. A. Easley, R. H. Ennis, R.

N. Evans, L. R. Goulet, N. E. Gronlund, J. T. Hastings, P. E. Hemp, K. B. Henderson, R. A. Henderson, D. D. Henry, B. Hicks, L. G. Humphreys, J. M. Hunt, W. P. Hurder, W. D. Johnson, R. S. Jones, L. Jordan, C. J. Karier, M. B. Karnes, L. G. Katz, A. B. Knox, C. Lavatelli, E. C. Leppert, H. H. Lerch, M. L. Maehr, T. Manolakes, M. E. Mather, J. E. McGill, C. H. McGuire, C. J. McIntyre, W. P. McLure, F. McMurray, L. E. Metcalf, V. Miller, W. Moore, T. U. O'Banion, C. H. Patterson, A. Peshkin, L. J. Phipps, A. Purves, S. P. Quigley, J. Raths, F. M. Raubinger, S. Rosen, B. Rosenshine, L. J. Rubin, T. J. Sergiovanni, J. H. Shores, P. B. Shoresman, R. H. Simpson, J. M. Slater, R. A. Smith, H. T. Spitze, B. Spodek, R. Stake, M. Tatsuoka, R. M. Tomlinson, K. J. Travers, L. R. Tucker, J. L. Walker, R. E. Williams, J. S. Zaccaria

Associate Professors: E. F. Anderson, R. K. Brown, F. D. Carver, D. Clegg, J. E. Erickson, E. L. Evertts, W. Feinberg, B. P. Fillion, J. A. Fley, O. E. Gould, A. F. Gregorc, A. D. Groteluesche n, K. T. Hill, G. A. Hoke, R. L. Ince, J. R. Jenkins, F. L. Johnson, H. R. Kaczkowski, K. R. Koenke, R. Linn, J. W. Loeb, T. J. Long, A. L. Madsen, T. L. McGreal, H. A. Moses, R. F. Payette, H. G. Petrie, M. J. Phillips, A. G. Rezler, F. A. Rodgers, K. G. Scott, G. M. Spriggs, H. J. Sredl, J. Stern, R. A. Tinkham, H. Trueba, P. C. Violas, R. W. Walker, J. L. Wardrop, C. M. Weller, C. K. West, I. Westbury, D. L. Williams, B. A. Yates, R. R. Zehrbach

Assistant Professors: T. H. Anderson, S. R. Asher, D. Brandenburg, J. Brun, L. Clinton, A. J. Diekema, R. G. Erskine, J. L. Forsythe, W. Foster, T. E. Gamble, B. Gardner, M. W. Gold, M. B. Griggs, E. R. House, J. Kintgen, S. R. Levy, J. M. Lucas, A. Mahaffey, J. Mancuso, W. E. Maxwell, E. F. McClure, M. E. McCoy, L. D. McGuire, D. S. Montanelli, R. Nelson, D. Omark, A. Ortony, R. S. Pelczar, D. L. Pierce, P. S. Riegel, S. A. Schumacher, M. M. Shorish, K. W. Smith, R. Smock, M. Spring, H. B. Thomas, J. E. Thomas, S. J. B. Thomas, D. R. Tunnell, M. Vittetoe, T. L. Wentling, R. Wilbur

Graduate Programs. Graduate students in the College of Education may specialize in:

Agricultural education
Aesthetic education
Behavioral foundations of education
Bilingual, bicultural education
Business, office, and distributive education
Comparative education
Continuing education
Computer applications in education
Computer-assisted instruction
Counselor education
Culture based education
Curriculum
Early childhood education
Early childhood education for the handicapped
Education of exceptional children (emotionally disturbed, learning disabilities, mentally retarded)
Educational administration and supervision
Educational psychology
Educational technology
Elementary school subject specialties (mathematics, language arts, science, social sciences)
Evaluation and measurement
General learning specialist
Health occupations education
Higher education

History of education
Home economics education
Human development
Industrial education
Learning and instruction
Philosophy of education
Quantitative and evaluative research methodologies
Reading
Rehabilitation counseling
Secondary education (English, mathematics, music, physical education, science, social science)
School psychology
Social foundations of education
Teacher education (elementary and secondary)
Vocational and technical education

Many other areas of specialization within education may be developed by the student and adviser. The department is especially well organized to permit interdisciplinary studies.

Admission and Aid. Admission to graduate and professional work requires an average of at least 3.5 on the last sixty semester hours of academic work and preparation appropriate to advanced study in the chosen field. Some departments require a grade-point average higher than 3.5. Most applicants hold teaching certificates but certification is not required for advanced graduate study in all fields. Certification can be achieved through special arrangements and additional work when it is desired or required as a part of a program of study. All applicants for study leading to doctoral degrees and some Advanced Certificates must provide Miller Analogies test scores. All applicants for graduate degrees in the Department of Special Education must submit either Miller Analogies or Graduate Record Examination test scores, three letters of recommendation, and a graduate appointment form with their application. The Department of Educational Psychology requires applicants for all graduate degrees to provide Miller Analogies and Doppelt Mathematical Reasoning test scores.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts and Master of Science. These degrees are for the research-oriented student. Eight units of study are required with the exception that students in the Department of Educational Administration must complete a ten-unit program. Each student must spend at least one year in residence, write a master's thesis, and defend it before a faculty committee.

Master of Education. This is a professional degree designed for those students seeking broad, fundamental, and practical preparation for work in the education professions. Students must complete eight units of study although students in educational administration must complete a ten-unit program. No thesis is required. Students may take four units of course work toward the degree on an extramural basis. Four units must be taken in residence; one way this requirement may be met is for the student to take two units each summer session for two summers.

The Advanced Certificate in Education. A master's degree in an appropriate field is required for admission to the Advanced Certificate program. Since this degree is a professional degree, two years of successful professional experience in education are required for admission. A minimum of eight units is required for the degree, four of which must be in residence. Four units must be at the 400 level. Up to four units of work may be taken in extramural courses. No thesis is required for this degree.

Doctor of Education. Programs leading to the Doctor of Education are designed to provide advanced professional training and develop further ability in the scholarly study of professional problems. Sixteen units of course work beyond the master's degree are required. Extramural credit may not be counted in this requirement. A thesis is required in addition to the sixteen units of course work. Minimum residence requirements may include either two consecutive semesters of at least three units each, or one semester of at least three units, plus the summer session immediately preceding or following, at least one and one-half units.

Doctor of Philosophy. This program is planned by the student with an adviser to develop the student's ability to do research in a specialized field of education. To become a candidate, the applicant must hold a master's degree with a major in education or some appropriate related subject. An applicant who has not written a master's thesis is required to prepare, submit, and defend a paper equivalent to a master's thesis.

Two years (sixteen units) in residence are required. Acceptance of credit for work earned elsewhere does not reduce the residence requirement. Two of the three stages defined by the Graduate College for the Ph.D. must be in residence. The residence period must include two successive semesters beyond the first stage in which the student takes a minimum of three units each semester.

A student is required to demonstrate competence in one of several research technique options. The general requirements of the Graduate College (pp. 16) for the Ph.D. degree must be met.

Professional Work Requirement. Each doctoral candidate in the College of Education should, as a part of the graduate program, complete an approved supervised professional work experience that consists of at least one-half time work for a semester. This requirement is to be completed during the period between admission and completion of degree requirements.

ELECTRICAL ENGINEERING

Head of the Department: E. C. Jordan

Correspondence and Information: Department of Electrical Engineering, University of Illinois at Urbana-Champaign, 155 Electrical Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: H. W. Ades, F. T. Adler, G. E. Anner, A. D. Bailey, J. Bardeen, D. L. Bitzer, S. A. Bowhill, R. M. Brown, R. T. Chien, P. D. Coleman, J. B. Cruz, Jr., G. A. Deschamps, F. Dunn, J. D. Dyson, W. L. Emery, E. W. Ernst, O. L. Gaddy, P. Handler, D. F. Hang, M. S. Helm, C. D. Hendricks, Jr., F. E. Hohn, N. Holonyak, Jr., D. F. Holshouser, E. C. Jordan, P. Kokotovic, B. C. Kuo, Y. T. Lo, P. E. Mast, W. Mayeda, P. E. Mayes, M. S. McVay, G. Metze, R. Mittra, D. E. Muller, S. Muroga, T. A. Murrell, W. R. Perkins, D. Pines, W. J. Poppelbaum, F. P. Preparata, S. R. Ray, J. E. Robertson, S. N. Roscoe, C. T. Sah, C. F. Sechrist, Jr., G. W. Swenson, Jr., J. T. Verdeyen, H. M. vonFoerster, N. Wax, H. D. Webb, K. C. Yeh

Associate Professors: W. G. Albright, R. B. Ash, M. L. Babcock, J. W. Beauchamp, R. W. Burtness, J. H. Cahn, B. E. Cherrington, D. H. Cooper, M. H. Crothers, J. M. Crowley, M. Geller, P. R. Egbert, F. J. Fry, A. H. Haddad, P. W. Klock, S. W. Lee, C. H. Liu, E. A. Mechtly, H. Merkelo, N. Narayana Rao, J. P. Neal, P. L. Ransom, H. G. Slottow, B. G. Streetman, T. N. Trick, R. J. Turnbull, L. Wozniak

Assistant Professors: C. L. Chen, T. A. DeTemple, A. W. Dipert, T. Itoh, R. L. Johnson, P. D. Schomer

Graduate Programs. Graduate study in electrical engineering, leading to the degrees of Master of Science and Doctor of Philosophy, is offered in four general areas: circuits and systems, which includes network synthesis, nonlinear circuits, control systems, and optimization; computers and information systems, which includes computers, switching theory, information theory, communication theory, information retrieval, artificial intelligence, and cybernetics; electromagnetic fields, which includes antennas, propagation, aeronomy, radio location, and holography; physical and quantum electronics, which includes solid state theory and devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles. In addition, the department cosponsors or participates in interdisciplinary areas of specialization in bioengineering, nuclear engineering, radio astronomy, quantitative neuroanatomy, ultrasonics, and electronic music.

Admission and Aid. Graduates of electrical engineering curricula substantially equivalent to that of the University of Illinois are eligible for admission. Graduates of curricula in the physical sciences and mathematics may also be admitted to advanced study if they have the necessary background to profit from graduate work in electrical engineering.

To be admitted, an applicant must have an admission average of 4.0. Financial aid is available to a limited number of qualified students in the form of University, government, and industrial fellowships, as well as teaching and research assistantships and tuition and fee waivers.

Master of Science. A minimum of eight units must be completed for the master's degree, including a thesis. At least four units must be at the 400 level, including specific courses in two of the four basic areas. Courses which are required in the undergraduate curriculum at Illinois cannot be applied to the credit requirements for an advanced degree.

Doctor of Philosophy. All students desiring to enter the doctoral program must take the electrical engineering qualifying examination. Students who earn the master's degree at the University of Illinois take the examination during the term they earn their eighth unit of graduate credit. Students who enter with the master's degree take the examination during the first term here. Admission to the doctoral program is based upon the quality of the course work, the qualifying examination, and an assessment of the ability of the candidate to do independent research work.

Eight units of course credit beyond the master's degree or equivalent, successful completion of the preliminary examination, eight units of thesis research, and a satisfactory thesis are minimum requirements for the degree of Doctor of Philosophy. If required by the adviser, a student must have one or two minors in addition to the major. A single minor requires four units in one field outside the major field, at least one of which must be at the 400 level. If two minors are required, each must consist of at least two units. Advanced courses in mathematics, physics, physiology, chemistry, nuclear engineering, and other branches of engineering are recommended minors.

Extramural Study. The department offers extramural graduate courses administered by the Division of University Extension leading to the Certificate in Engineering granted by the Extension Division. Requirements for the M.S. degree can be fulfilled by one semester of residence after completing the requirements of the certificate program. For information about this certificate program, write to the Division of University Extension, University of Illinois at Urbana-Champaign, 112 Illini Hall, Champaign, Illinois 61820.

ENGLISH

Head of the Department: George Hendrick
Director of Graduate Studies: Jackson J. Campbell
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois at Urbana-Champaign, 102b English Building, Urbana, Illinois 61801

FACULTY

Professors: A. L. Altenbernd, R. Barksdale, N. Baym, E. J. Brandabur, J. J. Campbell, D. Curley, E. H. Davidson, J. Friedman, G. Hendrick, A. G. Holaday, J. R. Hurt, K. Kinnamon, D. V. Kramer, L. Lieberman, R. W. Rogers, C. Sanders, C. H. Shattuck, D. A. Smalley, J. Stillinger, B. F. Wilkie, H. W. Wilson

Associate Professors: H. C. Cole, J. Dundas, A. Dussinger, J. P. Frayne, R. L. Fumento, F. E. Hodgins, A. Kaufman, U. M. Kaufmann, H. Marder, F. B. Moake, R. L. Schneider, G. Scouffas, G. B. Stillwell, J. C. Stubbs, A. M. Tibbets, J. B. Trahern, L. Waldoff, E. Watts

Assistant Professors: J. L. Hinely, W. D. Kay, C. Kyle, D. Majdiak, C. Nelson, M. Shapiro, J. F. Stottlar, J. Szirotny, G. G. Wright

Graduate Programs. The Department of English offers a full course of study leading to the Master of Arts and Doctor of Philosophy degrees. The Ph.D. program is, in general, designed to educate and train teacher-scholars who will take up positions in colleges and universities throughout the country. The Master of Arts program may be either a first step toward this professional degree or a final educational state for qualified students who wish to pursue their knowledge of English and American language and literature beyond the undergraduate level. Two special programs for teachers, the Master of Arts in the Teaching of English and the Trainer of Teacher-Trainers, are also offered. There is no creative writing program.

Admission and Aid. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least twenty semester hours of undergraduate college work in English and American literature, excluding required college work in rhetoric or composition. Except in extraordinary circumstances, applications must show an admission average of at least 4.0. Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been well above this minimum. The committee on admissions tends to select those applicants showing a solid undergraduate array of courses, a mastery of a foreign language, and real promise of earning degrees within a reasonable time. Preference must be given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. A candidate for the A.M. in English must spend at least two semesters or the equivalent in residence, and elect at least eight units of course work distributed among the chronological areas of English and American literature. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work as determined by the appropriate Educational Testing Service examination. A full-time student can complete this program in an academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's must apply formally and is considered in competition with applicants who are taking the master's elsewhere. Seldom are applicants accepted with graduate averages below 4.5. The student takes eight units of course work, planned in consultation with a two-member advising committee. There are no general requirements for further foreign language work, philology-linguistics, or outside minors, although certain fields of specialization do require further work along these lines. There are three formal examinations: the proficiency, general, and special examinations, which are taken at various stages of the student's progress. The first of these examinations tests the student's general critical ability; the second, general literary knowledge; and the third, competence in the field of study chosen as the student's area of concentration. Having passed these examinations, the student

goes on to write a dissertation under the direction of a committee composed of three professors. A full-time student may complete this program in three years beyond the master's degree.

Special Programs. At the present time the department offers two special degrees: the Master of Arts in the Teaching of English, and a special doctoral program, the Trainer of Teacher-Trainers, which is designed to prepare candidates to serve as teachers of teachers or for English supervisory positions. Those interested should write for information to the Advisor of Teacher Education Programs, Department of English, University of Illinois at Urbana-Champaign, 109 English Building, Urbana, Illinois 61801.

ENGLISH AS A SECOND LANGUAGE

Director of the Division: Katharine Aston
Correspondence and Information: Director, Division of English as a Second Language, University of Illinois at Urbana-Champaign, 3070 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: K. Aston, Y. Kachru
Assistant Professors: L. Bouton, T. Buckingham, J. Cowan, W. Dickerson, E. Enata, M. Hussey, M. Keen, S. Taylor

Graduate Program. The Division of English as a Second Language offers a Master of Arts in the Teaching of English as a Second Language. The curriculum leading to the degree is interdisciplinary and includes optional study streams in the following areas: General ESL/EFL (English as a Second Language/English as a Foreign Language), Bilingualism/Bidialectalism, TESL/TEFL Administration, and Technological Aids for TESL/TEFL. Underlying all four optional streams are three required core courses and two practicums in TESL/TEFL. For each study stream there are also: 1) select required subject areas in which one course must be completed per area, and 2) open elective courses, in which one unit may be completed for pass/fail. Also open to students in the MATESL curriculum are overseas internships cosponsored with on-the-site institutions. Students earn a minimum of two units of graduate credit per year in integrated study concurrently with their teaching assignments in the field. Through its extensive scope and the diversity of curriculum options, the master's program prepares personnel for both domestic/foreign programs and projects.

Students who wish to earn the degree of Doctor of Philosophy with a specialization in the teaching of English as a second or foreign language, or as a second dialect, must complete their study for the advanced degree in a relevant department.

Admission and Aid. Applicants for admission must present appropriate academic preparation in a relevant discipline such as English, linguistics, a foreign language, or a teacher training curriculum in one of the above or in elementary education. Native speakers of English must have studied at least one foreign language for four university semesters or the equivalent, or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English.

For a limited number of students studying on campus, teaching assistantships including tuition and fee waivers are available. All students who are out in the field in the overseas options receive monthly stipends; transportation costs to and from the overseas assignments are also covered if the assignments are completed. No transportation costs are paid for dependents.

ENVIRONMENTAL STUDIES

Director: B. B. Ewing
Correspondence and Information: Institute for Environmental Studies, University of Illinois at Urbana-Champaign, 911 West High Street, Urbana, Illinois 61801

Graduate Programs. The Institute for Environmental Studies provides coordination and support for the development of interdisciplinary and multidisciplinary programs of research, teaching, and public service in the general area of environmental studies. The mission of the institute is accomplished through the programs of task forces, the Water Resources Center, and the Center for Human Ecology.

Task forces include the study of lead and other metals in the environment, the study of toxic substances, and land and water resources planning. The metals task force involves about thirty graduate students from various fields of specialization. The two new task forces provided, shortly after their inception, support for three to five graduate students. The Water Resources Center in the 1972-73 academic year provided support for approximately thirty-five graduate research assistants located at five educational institutions in Illinois. A little over half of these were on the Urbana-Champaign campus of the University of Illinois.

The Center for Human Ecology provides the primary academic effort of the institute. The center offers eight Environmental Studies courses or seminars. No academic degree programs are offered in Environmental Studies.

EXTENSION EDUCATION

Graduate Adviser and Professor: Gertrude E. Kaiser
Correspondence and Information: Extension Education, University of Illinois at Urbana-Champaign, 212 Mumford Hall, Urbana, Illinois 61801

Graduate Program. The Master of Extension Education is a professional program providing advanced study in agriculture and home economics, including further study in the social sciences.

Admission. Applicants are expected to hold a bachelor's degree in agriculture, home economics, or a closely related field and have an admission average of at least 3.5.

Degree Requirements. The program consists of a minimum of eight units with a thesis or nine units without a thesis. Three units must be in graduate-level courses with one unit in the major field. A major, consisting of four units, may be taken in agriculture, home economics, or the social sciences. Students majoring in agriculture or home economics select four additional units from the social sciences; those majoring in the social sciences select four additional units from agriculture or home economics. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. Students majoring in home economics must take work in three of the four major divisions of that department, unless they demonstrate proficiency in one or more of the areas by examination. At least four units must be earned in residence on the Urbana-Champaign campus. Total extramural credit cannot exceed three units.

FINANCE

Head of the Department: James W. Leonard
Correspondence and Information: Department of Finance, University of Illinois at Urbana-Champaign, 340 Commerce Building (West), Urbana, Illinois 61801

FACULTY

Professors: C. T. Arlt, W. R. Bryan, T. E. Cammack, R. W. Mayer, R. I. Mehr, R. C. Osborn, P. M. Van Arsdell (emeritus)
Associate Professors: I. Cochrun (emeritus), J. R. Cooper, S. W. Forbes, J. W. Leonard, C. M. Linke
Assistant Professors: K. L. Guntermann, R. T. LeClair, D. L. Stevens, G. C. Wagner, J. K. Zumwalt

Graduate Programs. The Department of Finance offers graduate work leading to the Master of Science and Doctor of Philosophy. The following fields are available for specialization: money, credit, and banking; corporation finance; investment; insurance; and urban economics and real estate.

Admission and Aid. The required admission average is 4.0, although applications of students with averages below 4.0 but above 3.75 may be considered in some cases. The applicant is expected to have had at least twenty-seven hours of undergraduate work in social science, fifteen hours of which must have been in economics, including a course in principles of economics and other courses for which the course in principles is a prerequisite; credit in the courses in mathematics and statistics required for the bachelor's degree from the College of Commerce and Business Administration at the University of Illinois, or their equivalent, and sufficient background in the finance area and the related fields of accountancy and business administration to support, in the judgment of the graduate adviser, the candidate's educational objective.

A candidate who elects finance as a minor for either the master's degree or the doctorate must have had at least twelve hours of undergraduate work in social science, eight hours of which must have been in economics, including a course in principles of economics and other courses for which the course in principles is a prerequisite, and sufficient background in the finance area and in the related fields of accountancy and business administration to support, in the judgment of the graduate adviser, the candidate's educational objective. Financial aid is available to a limited number of qualified students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. A candidate for the master's degree must spend at least two semesters in residence. The credit requirement for this degree is eight units if the student chooses the thesis option or ten units if he chooses the nonthesis option. Two units of economic theory are required under both options. Two units of quantitative analysis are required under the nonthesis option and one unit is required under the thesis option.

Doctor of Philosophy. The doctoral candidate must obtain credit in the second course in calculus and a course in economic statistics at the graduate level. Graduate study in accountancy or statistics or both is advised strongly for such candidates. The first stage must include two units of economic theory, four units of finance, and two additional units in finance or related fields. Two of the finance units should be in thesis research. The second stage includes eight units which provide a concentration in finance, understanding of one or more fields in economics in addition to economic theory, and proficiency in any other minor field offered. After passing the preliminary examination, the candidate engages in eight units of independent research and seminars devoted to the dissertation.

FOOD SCIENCE

Head of the Department: Arthur J. Siedler
Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois at Urbana-Champaign, 567 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: H. H. Draper, F. A. Kummerow, A. I. Nelson, T. Nishida, Z. J. Ordal, A. J. Siedler, M. P. Steinberg, J. Tobias, R. M. Whitney, L. D. Witter
Associate Professors: B. E. Haskell, P. V. Johnston, E. G. Perkins, L. S. Wei
Assistant Professors: C. Argoudelis, L. K. Ferrier

Graduate Programs. The Department of Food Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: chemistry; engineering; microbiology; nutrition; and processing.

Admission and Aid. A student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Background deficiencies will be removed with graduate credit courses designed for this purpose. The admission average is 3.75. Applications from students with averages between 3.75 and 3.5 may be considered for admission with probationary status.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. To obtain a master's degree, a student must have two and three-fourths units in food science. The remainder of the eight units of credit required consists of graduate courses selected from inside or outside the department which are appropriate for the training and development of the student in the field of specialization. A thesis may be required at the option of the candidate and adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the Doctor of Philosophy must have additional credit in seminar (one-fourth unit) and thesis research (eight units). The rest of the sixteen units required for the degree will consist of graduate courses selected from inside or outside the department which are appropriate for training in the student's field of specialization. In addition, the candidate must demonstrate proficiency in one foreign language, as approved by the adviser, in which adequate scientific literature exists and which is neither the student's native tongue nor English. Also the student must complete a special option approved by the adviser which may be counted as part of the sixteen required units of credit. Upon the completion of all formal courses, language and special option requirements, or during the last semester of the course work, the student is required to take a series of written preliminary examinations. The final eight units after passage of the preliminary examinations are spent in research. Upon the submission of the dissertation, the candidate is admitted to the final oral examination before a faculty committee. Students specializing in nutrition may elect to receive their degree in nutritional sciences by satisfying the specific requirements of that program. (See page 105.) Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

FORESTRY

Acting Head of the Department: I. I. Holland
Correspondence and Information: Department of Forestry, University of Illinois at Urbana-Champaign, 219 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: A. R. Gilmore, I. I. Holland, C. S. Walters
Associate Professors: J. J. Jokela, R. G. Rennels
Assistant Professors: F. A. Bazzaz, D. E. Koeppe

Graduate Program. The Department of Forestry offers graduate work leading to the Master of Science degree. The Doctor of Philosophy degree is not granted by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint appointment in another department, or is on the staff of an interdisciplinary doctoral program. Such areas of study include economics, environmental biology, genetics, plant physiology, and soils.

Admission and Aid. The prerequisite for graduate study is a bachelor's degree in forestry or a closely related field. Except in extraordinary cases, applicants must have an admission average of 3.75. A limited number of half-time assistantships is available.

Master of Science. To qualify for the master's, a student must earn eight or more units of graduate credit with at least three units in courses at the 400 level. Depending upon their backgrounds, nonforestry graduates may be required to complete certain basic forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student and to deepen understanding in such areas as ecology, economics, entomology, genetics, mensuration, physiology, soils, statistics, or wood science. Advanced courses in special interest fields are found in various departments. In most cases a thesis is required, but it may be waived if such waiver will result in a better program for an individual student. Forestry seminar is required of all graduate students.

FRENCH

Head of the Department: R. J. Nelson
Correspondence and Information: Department of French, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: B. C. Bowen, E. Jahiel, F. Jost, P. Kolb, B. H. Mainous, F. W. Nachtmann, R. J. Nelson, W. M. Rivers, Y. Velan
Associate Professors: W. E. Bowen, H. C. De Ley, S. E. Gray, F. M. Jenkins, M. K. Myers, L. B. Price
Assistant Professors: G. Savignon, S. Shinall, E. Talbot

Graduate Programs. The Master of Arts program focuses on French literature, French language and linguistics, and French culture in a combination of courses allowing individual emphasis, as desired, in one or two of these specializations. Candidates who wish to go on for doctoral work may do so in the department's Division of French Literature; candidates who wish to complete doctoral work in French literature and other aspects of French culture (artistic, socio-political, etc.) may do so in the department's Division of Expanded French Studies which collaborates for this purpose with other departments and educational units on the campus. The Master of Arts in the Teaching of French, administered in the department's Division of Teacher Education, is designed for those who are interested in secondary schools or junior and community colleges. The Doctor of Philosophy is designed to prepare (a) scholar-teachers at the college or university level, and (b) specialists in francophone culture looking to careers in other fields (government, industry, public service, etc.).

Admission and Aid. Students are normally considered for admission who have an admission average of 4.0. Applications of students with grade-point averages below

4.0 but above 3.5 are considered on an exceptional basis. A slightly better average is expected in work in French.

Students electing French as a major subject should have had a college major in French, including practical work in the use of the language and advanced work in literature. Some knowledge of other romance languages and literatures is desirable. Fellowships, assistantships, and tuition and fee waivers are available.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates wishing to go on to the doctoral program must write a master's thesis. Depending on its quality, this thesis serves as a certification for permission to enter the doctoral program of the Graduate College. Candidates who do not wish to go on to the doctoral program must pass an examination based on a general reading list. A course in research methods is also required. Every candidate shall demonstrate an oral ability to communicate effectively on a sustained basis in the French language. This demonstration shall take the form of a half-hour discussion, at some time in the second semester of residence, with at least two members of the faculty on a topic of the candidate's choosing.

Master of Arts in the Teaching of French. An applicant for admission is expected to have a bachelor's degree in French teacher education. Candidates for this degree must complete a total of eight units as follows: four units in French civilization, language and/or literature (excluding French 311, 313, 314), at least two of which must be at the 400 level; one unit in educational psychology; one unit in history and philosophy of education; two units of electives, one of which must be taken in French. Remedial work in French diction, phonetics, and syntax may also be required of candidates who show deficiencies in these areas upon entering the program. In addition to completion of course work, candidates will be required to pass a comprehensive written and oral examination during their last semester of study, demonstrating a satisfactory level of communicative competence in French and the ability to integrate effectively their knowledge of French language, literature, and culture in developing a philosophy and practice of teaching.

An alternative program for candidates who do not have teacher certification requires eleven hours of undergraduate professional education (including seven hours in student teaching), a course in American government, and three hours of health and/or physical education, in addition to the M.A.T. program described above. Candidates should also note that certification by the state of Illinois requires U.S. citizenship or a declaration of intent.

Doctor of Philosophy. Areas of specialization within the degree program are French literature, francophone studies, French language and language learning, and romance linguistics. Candidates entering the doctoral program with a Master of Arts degree earned elsewhere will be expected to pass a qualifying examination during the first half of their first semester of residence. Candidates for specialization in francophone culture, or French language and language learning or romance linguistics, programs stressing interdepartmental cooperation, should write to the chairman of the Departmental Committee on Admissions and Fellowships indicating their individual orientations and career expectations. All candidates are expected to include in their programs courses over the range of French literary, cultural, and linguistic history. Candidates are also expected to demonstrate a reading and speaking proficiency in French and English and a reading proficiency in one other language related to their particular area of specialization in the study of French. Candidates are also required to include in their program the departmental course in research methods and literary analysis, a combination of studies and seminar courses, and a minor in work outside the department. (Candidates in francophone studies, French language and language learning, and romance linguistics may have a greater distribution of units of work outside the department.) Candidates must pass a preliminary examination and write a successful dissertation. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program for students planning a career in teaching.

GENERAL ENGINEERING

Head of Department: J. S. Dobrovolny
Correspondence and Information: J. E. Pearson, Department of General Engineering, University of Illinois at Urbana-Champaign, 117 Transportation Building, Urbana, Illinois 61801

FACULTY

Professors: J. S. Dobrovolny, R. A. Jewett, B. O. Larson, E. C. McClintock, Jr., J. E. Pearson
Associate Professors: H. Streeter, L. Wozniak
Assistant Professors: T. F. Conry, B. M. Hannon, G. E. Martin, L. D. Metz, D. C. O'Bryant, E. I. Odell, M. H. Pleck, R. L. Ruhl, D. P. Schneider, H. J. Sprengel

Graduate Program. Although the Department of General Engineering does not offer a graduate degree program, it does offer, in collaboration with other departments of the College of Engineering, an area of specialization in engineering design for candidates for the Master of Science. Students in the following areas may elect this option: mechanical engineering, civil engineering, engineering mechanics, electrical engineering, ceramic engineering, aeronautical and astronautical engineering, industrial engineering, nuclear engineering, and computer science. This area of concentration is organized to prepare students to participate in the solution of wide-ranging and multidisciplinary problems through the process of engineering design. Interested students are encouraged to write for a descriptive brochure.

GENETICS

Correspondence and Information: Director, School of Life Sciences, University of Illinois at Urbana-Champaign, 387 Morrill Hall, Urbana, Illinois 61801

Graduate Program. A Doctor of Philosophy program in genetics is provided through the cooperative efforts of many different departments and is administered by the University Committee on Genetics. Training is available in molecular, microbial, developmental, population, quantitative, applied plant and animal, behavioral and human genetics, and in cytogenetics and evolution. Experience is provided with a choice of organisms ranging from viruses to vertebrates. Students seeking master's degrees are directed to the various departmental programs, or to the master's program in biology offered by the School of Life Sciences.

Admission. Applicants for admission should have at least a 4.0 admission average, but may, in special circumstances, be considered for admission with a 3.75 average. They should also have completed courses in quantitative and organic chemistry, trigonometry, analytic geometry, and one year of college physics. Calculus is strongly recommended.

Doctor of Philosophy. During the first two years, candidates obtain a broad background in the major disciplines of genetics (molecular and microbial, population or quantitative, and cytogenetics) and complete courses or demonstrate proficiency in biochemistry, calculus, and statistics. During the first year, a program of study is determined by the student in consultation with the adviser and the Committee on Genetics.

Thesis research may be carried out under the direction of any of the many staff members throughout the University. Candidates also usually elect minors in one of the biology departments and in either chemistry or mathematics, but other options are available.

GEOGRAPHY

Head of the Department: John Thompson
Director of Graduate Admissions: Jerome D. Fellmann
Correspondence and Information: Director of Graduate Admissions, Department of Geography, University of Illinois at Urbana-Champaign, 220 Davenport Hall, Urbana, Illinois 61801

FACULTY

Professors: C. S. Alexander, S. A. Chagnon, Jr., J. D. Fellmann, F. W. Foster, W. P. Lowry, H. G. Roepke
Associate Professors: J. A. Jakle, C. C. Roseman
Assistant Professors: F. L. Charton, D. L. Johnson, J. V. O'Loughlin, J. J. Monk

Graduate Programs. The Department of Geography offers work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. A program for prospective teachers, the Master of Science in the Teaching of Geography, is also available. At the master's level the program emphasizes broad understanding of the main systematic areas of the discipline and the acquisition of basic research competencies; programs for doctoral candidates seek depth in areas chosen for specialization and, through further study in research techniques and in allied disciplines, strive to lead students into innovative research. Detailed descriptions of the programs may be obtained from the departmental office.

Admission and Aid. Students applying for admission to the master's programs are expected to have a reasonable undergraduate background in geography and an admission average of at least 4.0. An average of at least 4.25 in the undergraduate major is required. Applicants with averages below 4.0 but above 3.75 will be considered where other credentials are outstanding. Ph.D. candidates are expected to have at least a 4.5 average in previous graduate work. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the Master of Science; others receive the Master of Arts. At least four of the minimum of eight units of graduate credit required for the master's degree, including research courses, must be in geography. A full-time student can complete this program in one calendar year. A 4.25 grade-point average is required for degree certification.

Master of Science in the Teaching of Geography. Candidates for this degree must earn four units in geography, two of which are geography electives, two units in education, and two units in electives. The admission average is 3.5. Specific degree requirements may be obtained from the degree adviser, Professor Janice J. Monk, 270 Davenport Hall, Urbana, Illinois 61801.

Doctor of Philosophy. Admission presupposes distinction in completing the University of Illinois master's program in geography or its equivalent. In the doctoral program, the student develops depth in areas chosen for specialization and further advances in research competence. Two units of study in allied disciplines and a minimum of six additional units in geography are required. A 4.5 graduate average must be maintained for degree certification. A student must complete the course requirements as determined by an individually planned program, and qualify for the departmental preliminary examination within five semesters of entering the program. Normally, at some stage of the program students are expected to show their capabilities as instructors by serving as teaching assistants.

GEOLOGY

(Including Earth Science)

Head of the Department: Fred A. Donath
Educational Coordinator: W. Hilton Johnson
Correspondence and Information: Educational Coordinator, Department of Geology, University of Illinois at Urbana-Champaign, 249 Natural History Building, Urbana, Illinois 61801

FACULTY

Professors: A. V. Carozzi, C. A. Chapman, C. W. Collinson, P. A. Domenico, F. A. Donath, J. J. Fripiat, J. C. Frye, D. L. Graf, A. F. Hagner, D. M. Henderson, G. deV. Klein, R. L. Langenheim, Jr., D. J. Stanley (Adjunct)
Associate Professors: D. E. Anderson, T. F. Anderson, D. B. Blake, W. H. Johnson, C. J. Mann, P. A. Sandberg, D. S. Wood
Assistant Professors: J. T. Holder, V. V. Palciauskas

Graduate Programs. The Department of Geology offers programs leading to the Master of Science and Doctor of Philosophy in Geology and the Master of Science in the Teaching of Earth Science. Programs in clay mineralogy, engineering geology and rock mechanics, environmental geology, geochemistry, geophysics, geomorphology and glacial geology, hydrogeology, marine geology, mathematical geology, mineral deposits, mineralogy and petrology, oceanography, paleontology and stratigraphy, sedimentology, sedimentary petrography, and structural geology give students a wide choice of courses and areas of specialization.

Admission and Aid. Admission requires an admission average of 4.0. Applications from students with averages below 4.0 but above 3.75 are considered on an individual basis. Geology majors with basic courses in biology, calculus, chemistry, and physics are given preference, but students from cognate fields are encouraged to apply. An individual program of study will be outlined to provide the essential background to meet the needs of a student with a deficiency in geology or in an allied science.

Financial aid is available in the form of fellowships, teaching and research assistantships, and tuition and fee waivers. In addition, part-time assistants are employed by the State Geological Survey, which is located on campus.

Master of Science. The M.S. requires a minimum of eight units of credit of which two units are normally research credit for a satisfactory master's thesis. At least three units of course work must be taken within the department, and at least three units must be completed at the 400 level. The program is normally completed in one to two years.

Master of Science in the Teaching of Earth Science. Candidates must earn four units in geology, two units in other earth science areas, and two units in education (see page 28). In addition they must fulfill the requirements to be certified to teach at the secondary school level in Illinois.

Doctor of Philosophy. The Ph.D. requires an additional eight units of course work beyond the requirements for the master's degree, and the completion of a satisfactory dissertation, including eight units of research and seminar. A reading knowledge of French, German, or Russian is required. There are three formal examinations: the reading, the preliminary, and the final examinations. The first of these tests the student's ability to critically evaluate scientific literature, the second is focused on the student's proposed research for the dissertation and tests the student's preparedness for the proposed research, and the third evaluates the student's research ability as demonstrated by the completed dissertation. The program is normally completed in two to four years beyond the master's degree.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department: Harry G. Haile
Graduate Adviser: Elmer H. Antonsen
Correspondence and Information: Graduate Adviser, Department of Germanic Languages and Literatures, University of Illinois at Urbana-Champaign, 3072 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: E. H. Antonsen, H. G. Haile, H. Knust, R. Lorbe, J. W. Marchand, P. M. Mitchell, I. Rauch, H. Stegemeier
Associate Professors: J. M. McGlathery, R. D. Schier
Assistant Professors: M. Burkhard, C. Gray, P. Schwalbe

Graduate Programs. The Department of Germanic Languages and Literatures offers courses of study leading to the degrees of Master of Arts and Doctor of Philosophy in German, and Master of Arts in the Teaching of German. Fields of concentration for the Ph.D. degree are modern German literature; older German literature; and Germanic linguistics. Candidates for the Master of Arts degree may emphasize either literature or linguistics in their course of study. Detailed information concerning the requirements for advanced degrees is available through the departmental office and will be sent to prospective students along with the necessary application forms.

Admission and Aid. Applicants should have a 4.0 admission average. Applications of students with averages below 4.0 but above 3.5 are considered on an individual basis. Students should have completed a four-year course of undergraduate study in German corresponding to that of this University, be familiar with the principal works of German literature, and be able to follow lectures in the German language. Acquaintance with German history, philosophy, science, and art in their relation to the general European background is desirable. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. Candidates for the Master of Arts in German must complete eight units of graduate work and demonstrate proficiency in reading one language other than English and German (normally French). Deficiencies in undergraduate preparation may necessitate more than eight units to meet the requirements. Full-time students with good undergraduate training can normally complete the requirements in one academic year. The degree is awarded upon successful completion of a written and oral examination or upon the successful defense of a thesis.

Master of Arts in the Teaching of German. Candidates for the Master of Arts in the Teaching of German must earn four units in German, two units in the history and philosophy of education and educational psychology, and two units in electives.

Doctor of Philosophy. Students working toward the Ph.D. must complete eight units of course work beyond the master's and demonstrate proficiency in the reading of two languages other than English and German, one of which is normally French. Students in Germanic linguistics may substitute Russian for French, with the second language Scandinavian. After passing the written preliminary examinations the candidate can be admitted to the oral preliminary examination. Successful completion of the oral examination admits the student to candidacy for the Ph.D. degree. The candidate then must complete eight units of thesis research and successfully defend a thesis in an oral examination. Full-time students can complete this program in two years beyond the master's.

Study in Austria. The department sponsors a two-semester study program in Austria, based at the Pädagogische Akademie in Baden, a suburb of Vienna. In addition to serving undergraduates, the program also includes a limited number of assistantships for candidates for the Master of Arts in the Teaching of German and for other graduate students interested in giving their preparation a pedagogical component. Students may also attend lectures at the University of Vienna. Detailed information is available through the departmental office.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

GOVERNMENT AND PUBLIC AFFAIRS

Director of the Institute: S. K. Gove
Correspondence and Information: Institute of Government and Public Affairs, University of Illinois at Urbana-Champaign, 1201 West Nevada Street, Urbana, Illinois 61801

The Institute of Government and Public Affairs conducts policy-oriented research and public service. The focus of the research is on important areas of state and local government structure and process with emphasis on the problems of urbanization. Public service activities arise from and contribute to the research thrust through contact with public officials and the identification of research problems. The Institute offers no courses but its faculty members teach in various departments, guide student research, and direct intern programs. Results of institute research reach a wider audience by publication in institute-sponsored outlets as well as in books and articles published elsewhere. The Institute is an all-University unit that reports directly to the president.

HEALTH AND SAFETY EDUCATION

Head of the Department: William H. Creswell, Jr.
Correspondence and Information: Department of Health and Safety Education, University of Illinois at Urbana-Champaign, 117 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professors: W. H. Creswell, Jr., A. E. Florio, W. J. Huffman
Associate Professor: D. B. Stone
Assistant Professors: J. D. Brown, J. Conley, L. K. Olsen, T. W. O'Rourke

Graduate Programs. The Department of Health and Safety Education offers a program of study leading to the Master of Science in Health Education. Also, Health Education is one of the three options or areas of specialization leading to the Doctor of Philosophy that is offered through a joint relationship among three departments (Health and Safety Education, Physical Education, and Recreation and Park Administration) of the College of Physical Education. The Ph.D. program is designed to prepare graduates for positions of leadership in teaching, research, and service in colleges, universities, and health-related agencies in the United States and in other countries.

Admission and Aid. Students admitted to the M.S. program are required to have an admission average of 3.75 (applications from students whose grade-point average

is below 3.75 but above 3.5 may be considered), thirty semester hours of approved undergraduate credit in health education or closely related courses, twenty-four semester hours of approved undergraduate credit in science, sixteen semester hours of credit in education, and a course in statistics or measurement.

The Ph.D. program is one of three areas of specialization offered through the graduate department of the College of Physical Education. The admission requirements include the following: an acceptable grade-point average in undergraduate work and an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test and on the aptitude section of the Graduate Record Examination, and three letters of recommendation.

Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Science. The program of study for the Master of Science is normally completed in one year of full-time study. Eight units of work are required, including the following: four units in health education, one unit of which may be in approved courses closely related to health education; two units in education; satisfactory completion of the graduate seminar; and presentation of an acceptable thesis in health education (two units). Candidates may petition to waive the thesis but will be required to take two units in lieu of thesis credit, and, in addition, to pass a final comprehensive written examination in health eduction.

Doctor of Philosophy. Candidates for this degree must complete a minimum of twenty-four units of credit, including the following: a minimum of eight units in the major or related fields; one minor for a minimum of four units, or two minors for a minimum of two units each (in both cases outside the major and related fields); ability to translate accurately two foreign languages, or ability to read, write, and converse satisfactorily in one foreign language (two additional approved graduate course units may be substituted for each of the two foreign languages); a seminar in the major field; and completion of an acceptable dissertation.

HISTORY

Chairman of the Department: Robert M. Sutton
Director of Graduate Studies: Walter L. Arnstein
Correspondence and Information: Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: W. L. Arnstein, J. L. Bates, P. P. Bernard, R. B. Crawford, C. E. Dawn, W. D. Farnham, R. T. Fisher, Jr., W. Heinrichs, K. A. Hitchins, R. W. Johannsen, J. A. Nichols, D. E. Queller, P. W. Schroeder, W. U. Solberg, C. C. Spence, R. M. Sutton
Associate Professors: N. M. Belting, J. R. Dahl, L. E. Eastman, B. D. Hill, F. C. Jaher, B. B. Kling, T. A. Krueger, J. L. Love, R. M. McColley, J. P. McKay, R. E. Mitchell, D. L. Ransel, R. C. Trexler, B. P. Uroff, R. W. Waller
Assistant Professors: R. L. Harris, Jr., C. M. Hibbard, R. C. Jennings, C. C. Stewart, H. J. Wechsler

Graduate Programs. The Department of History offers graduate courses leading to the Master of Arts and the Doctor of Philosophy. Complete details of these programs may be found in the department's brochure on graduate study in history. The Master of Arts degree may be either the first stage in preparation for the degree of Doctor of Philosophy or a terminal degree. Two special programs for teacher training are

available, the Master of Arts in the Social Sciences and the Master of Arts in the Teaching of Social Studies. See page 118.

The following fields of specialization are offered: ancient Greece; ancient Rome; medieval Europe to 1300; Europe, 1300-1648; Europe, 1648-1815; Europe since 1815; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; early America to 1830; United States since 1815; Latin America; history and philosophy of science; and history of international relations since 1871. Topical fields may also be arranged with the consent of the graduate advisers.

Admission and Aid. A student who wishes to be considered for admission to graduate work in history is required to have an admission average of 4.0 during the last two years of completed undergraduate work. A student who has done graduate work in a recognized institution without receiving a degree may petition for credit toward an advanced degree by passing examinations in this work. Results of the Graduate Record Examination Aptitude Test and the Advanced Test in History should accompany applications for admission. Undergraduate linguistic preparation, especially in French, German, or Russian, is important. For ancient, medieval, and Renaissance history, some knowledge of Greek or Latin is essential. Spanish is important for certain fields of European, American, and Latin American history. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Arts. Candidates are expected to take at least two units in two of the fields of specialization for the Ph.D., as listed in the graduate brochure. A minimum of eight units is required, and three of these units must be at the 400 level and include at least one problem course and one research seminar with grades of B or better. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement. A candidate must demonstrate ability to read one foreign language related to his or her field of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the Ph.D. must take a minimum of sixteen units beyond the master's degree. Eight of these units may be thesis research credit. Two research seminars are normally required for all candidates if these were not taken here in the master's program. A course in the history of historiography and a course in the problems in the teaching of college history must also be taken. A candidate must demonstrate ability to read two foreign languages related to his or her field of interest as approved by the graduate advisers. In certain circumstances students may substitute a skill represented by specific advanced courses involving quantification for the second language. The candidate must offer at least three fields in history, to be chosen from the fields of specialization listed above, with no more than two in the same area, for the preliminary examination. Students offering more than three fields may offer as major or minor field an approved topical area of specialization such as European Economic History, American Intellectual History, or English Constitutional History. Candidates interested in specializing in American culture may elect a major in American history with a first minor, three units, in American literature, and a second minor, two units, in the history of fine arts in the United States.

HUMAN RESOURCES AND FAMILY STUDIES, SCHOOL OF

Head of the Department: Pauline C. Paul

Correspondence and Information: School of Human Resources and Family Studies, University of Illinois at Urbana-Champaign, 260 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: M. Dunsing, Q. B. Mills, R. B. Smith, L. D. Trebilcock, P. C. Paul, F. O. Van Duyne

Associate Professors: H. H. Alexander, K. A. Anspach, E. L. Brown, B. E. Haskell, C. McKenna, W. M. Mowrer, F. E. Webb, H. K. Zwolanek

Assistant Professors: J. H. Anderson, J. L. Hafstrom, B. V. Hummel, F. M. LaFont, B. J. Peterson, M. F. Picciano, M. K. Weir

Graduate Programs. The School of Human Resources and Family Studies offers work leading to the Master of Science or Master of Arts in Home Economics, Master of Science in Home Economics Education, and Doctor of Philosopy in Home Economics with majors in family and consumption economics and in foods and nutrition.

Admission and Aid. The admission average is 3.75. Applications of students with averages below 3.75 but above 3.5 are considered on an individual basis. Undergraduate course requirements for admission depend on the area of specialization selected for graduate work.

Financial aid is available for a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts and Master of Science. The major for a master's degree in home economics may be in one of six curricula. Candidates must complete a minimum of eight units (nine if a thesis is not submitted) of which at least four must be in home economics. Four of the total units, including at least two in home economics, must be in 400-level courses. Programs are available in child development and family relationships; family and consumption economics; family housing and household management; foods and nutrition; general home economics; and textiles and clothing. In addition, family and consumption economics requires two units of economic theory; foods and nutrition requires biochemistry. Family housing and household management requires two units in social sciences; courses in housing may be taken in agricultural mechanization, architecture, and home economics. General home economics requires courses in three of the other five areas of specialization in home economics.

Master of Science in Home Economics Education. Candidates must earn eight units, four of them in home economics. Three of the eight units must be at the 400 level and at least one of these must be in home economics. Two units are required in foundation courses in general education and two units are required in home economics education.

Doctor of Philosophy. For a major in family and consumption economics required courses include four units of family and consumption economics, two at the 400 level; two units of economic theory (400 level); two additional units of economics and/or agricultural economics (400 level); two units of anthropology, psychology, and/or sociology, or one unit in these areas and one in family relationships; and one unit of applied statistics. Economics must be chosen as a minor field either as a sole minor or in combination with an area such as agricultural economics, anthropology, sociology, closely related areas in home economics, or an area involving international programs.

For a major in foods and nutrition, required courses include at least three units of foods and nutrition, two at the 400 level; one unit of statistical methods at the 400 level; courses in biochemistry and physical chemistry; and an advanced course in food microbiology or mammalian physiology. Additional courses in the above areas or in animal nutrition or food science are selected to satisfy major requirements. Candidates may minor in animal nutrition, biochemistry, food science, microbiology, physiology, or other appropriate areas.

HORTICULTURE

Head of the Department: C. J. Birkeland
Correspondence and Information: Department of Horticulture, University of Illinois at Urbana-Champaign, 124 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: C. Y. Arnold, C. J. Birkeland, J. R. Culbert, D. F. Dayton, J. B. Gartner, E. R. Jaycox, M. B. Linn, R. K. Simons, J. S. Titus, J. S. Vandemark, C. C. Zych
Associate Professors: D. B. Dickinson, H. J. Hopen, M. M. Meyer, C. A. Rebeiz, A. M. Rhodes, W. E. Splittstoesser

Graduate Programs. Graduate work is offered in the Department of Horticulture leading to the Master of Science and Doctor of Philosophy degrees. Students may specialize in phases of horticulture which include production, breeding, and genetics; physiology; ecology; weeds and their control; developmental anatomy; marketing; or apiculture. In addition to advanced courses in horticulture, students may take courses in agronomy (crops, soils), botany, food science, genetics, statistics, plant pathology, chemistry, biochemistry, biophysics, entomology, or agricultural economics. Students may minor in any of these fields.

Admission and Aid. Applicants must show promise of achievement in their chosen area, have an admission average of 4.0 in their last sixty semester hours, and be approved by the Department of Horticulture. Applicants with an average below 4.0 but above 3.75 will be admitted only under unusual circumstances. Applicants should have adequate preparation in the fundamental sciences. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. A minimum of eight units must be earned. This can be completed by a full-time student in an academic year. A written thesis is optional.

Doctor of Philosophy. The candidate must complete eight units of course work beyond the master's degree and pass a preliminary examination. The candidate must also complete eight units of thesis research and submit an acceptable thesis. Competence in a foreign language may be required, depending on the area of specialization and recommendations of the student's advisory committee. Students specializing in plant physiology or genetics may elect to receive their degree in biology by satisfying the specific requirements of that program. See page 91.

JOURNALISM

Head of the Department and Director of Graduate Study: Jay Jensen
Correspondence and Information: Department of Journalism, University of Illinois at Urbana-Champaign, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: J. Carey, G. Graham, J. Jensen, H. Maclay, T. Peterson, J. Schacht
Associate Professors: G. Gilmore, T. Guback, G. Hanson, R. Hildwein, N. Wiggins
Assistant Professors: R. Boston, J. Erickson, M. Gerhsen, A. Kreiling, L. Slovonsky

Graduate Program. The Department of Journalism offers graduate work leading to the Master of Science in Journalism. The department does not offer a Ph.D. degree. For the program leading to the Doctor of Philosophy in Communications, see pages 59-60.

Admission and Aid. A grade-point average of 4.0 is the competitive standard, but does not guarantee admission. Applicants with averages below 4.0 but above 3.75 may be considered in individual cases. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees. Positions outside the department calling for journalistic skills may be available to qualified applicants.

Master of Science. Requirements for the master's degree include the following: (1) A major of four units, or three units and one additional unit approved by the department. Candidates without undergraduate work in journalism or equivalent professional experience may be required to complete one unit of news editing, one unit of advanced undergraduate courses in writing, and, in exceptional cases, some combination of courses without graduate credit. (2) A minor of at least two units, normally in an area outside the College of Communications. (3) A thesis of one unit, or preparation of a topic in journalistic form for publication or broadcast, for one unit. Students also have the option of doing both. (4) A minimum of three units in courses at the 400 level, at least two of which must be in journalism. (5) A written report on the current master's reading list. (6) A minimum total of eight units with a grade-point average not lower than 3.875.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: M. Rothbaum
Correspondence and Information: Institute of Labor and Industrial Relations, University of Illinois at Urbana-Champaign, 504 East Armory Avenue, Champaign, Illinois 61820

FACULTY

Professors: M. Derber, H. Folk, W. Form, W. H. Franke, P. L. Garman, P. T. Hartman, C. L. Hulin, B. Karsh, M. Rothbaum, K. Taira, H. C. Triandis, M. Wagner
Associate Professors: G. B. Graen, J. Scoville
Assistant Professors: P. Gerhart, J. Kimberly, W. Hendricks

Graduate Programs. The Institute of Labor and Industrial Relations offers a Master of Arts and a Doctor of Philosophy. Graduate instruction is offered in trade union, public employee, and management organization; in the accommodation of these organizations through the process and structure of collective bargaining; in personnel administration and employee relations; in manpower and human resources programs and policy; in the role of the government in legislating labor standards and labor relations; in the formulation of public policy; and in comparative and international industrial relations. These matters are studied in the context of social, economic, and political change and are analyzed with the help of theoretical and empirical formulations of economics, history, law, political science, psychology, and sociology.

Admission and Aid. Students seeking admission to the master's program must meet the general entrance requirements of the Graduate College. In addition, an institute faculty committee reviews the undergraduate record of every candidate and may refuse admission to a student whose record indicates inadequate preparation. A course in statistics is the only prerequisite for admission, although course work in the various social sciences is desirable preparation for the institute program.

Admission to the Ph.D. program is granted only to those students whose undergraduate and graduate records indicate that they are likely to successfully complete the requirements for the Ph.D. Admission requirements are a master's degree or equivalent in labor and industrial relations or an allied field, a master's thesis or similar evidence of research competence, and three letters of recommendation. Prerequisites are courses in labor problems and statistics; college algebra and first-year calculus are recommended. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts. Candidates have a choice of study programs. Program A requires eight units of graduate credit, two of which are granted for successful completion of a thesis. Program B requires ten units of course work. Common requirements in both programs include one unit of credit in research methods, one unit of credit in quantitative analysis, responsibility for a list of required readings, and a comprehensive oral examination.

Doctor of Philosophy. The candidate's course work is concentrated in two or more social science disciplines related to a selected area of specialization; in addition, six units of course work in methodology and industrial relations theory are required.

LANDSCAPE ARCHITECTURE

Head of the Department: Robert B. Riley
Coordinator of the Graduate Program: Albert J. Rutledge
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois at Urbana-Champaign, 205 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: W. M. Keith, R. B. Riley
Associate Professors: A. J. Rutledge, D. L. Walker, Jr.
Assistant Professors: T. G. Harkness, L. D. Hopkins, M. H. Lindeman, R. W. Zolomij

Graduate Program. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture. The program is designed to enable students to gain fresh insights and experiment with new applications pertaining to land and its use by people. A pamphlet describing specific areas of study is available upon request.

Admission and Aid. The minimum average for admission consideration is 3.75. Those with lower averages may also be considered on an individual basis if they possess significant experience in professional landscape architectural work. Candidates from undergraduate design programs must accompany applications with samples of their design work.

Candidates may possess a bachelor's degree in landscape architecture or an undergraduate degree in another field. The latter are expected to complete prerequisite courses in the basic skill areas of landscape architecture before pursuing graduate level study. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Degree Requirements. A student must complete a minimum of eight units comprising at least four units taken within the department and at least two units of electives chosen from courses offered outside the department. Specific courses to be taken are determined in consultation with an adviser.

LATIN AMERICAN AND CARIBBEAN STUDIES

Director of the Center for Latin American and Caribbean Studies: Merlin H. Forster
Correspondence and Information: Center for Latin American and Caribbean Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: J. Allen, W. Blaylock, J. Casagrande, F. Dovring, F. Fliegel, R. Findley, M. Forster, D. Lathrap, L. Leal, A. Pasquariello, E. Rae, S. Schmidt, R. Scott, J. Thompson, N. Whitten, R. Zuidema
Associate Professors: A. Aiex, G. Behague, D. Butterworth, D. Grove, S. Kronus, J. Love, T. Meehan, R. Preto-Rodas, M. Saltarelli, M. Solaún, H. Trueba, J. van Es
Assistant Professors: A. Avellaneda, M. Azevedo, R. Byars, P. Drake, M. Francescato, R. Pelczar, R. Vandendries

Graduate Programs. Graduate minors in Latin American and Caribbean studies are administered by the director of the Center for Latin American and Caribbean Studies.

Candidates for the master's degree who elect a minor in Latin American and Caribbean studies must complete two units from the courses prescribed by the center. Doctoral candidates who elect a minor in this area must complete four units for a sole minor, or two units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center.

Students in technical and professional colleges and schools of the University who seek knowledge of Latin American and Caribbean affairs, culture, and languages are invited to consult with the director of the center, or with their advisers, in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry on technical or professional work in the Latin American and Caribbean area for the government, private business, publications, or religious organizations.

LAW

Dean of the College of Law: John E. Cribbet
Associate Dean: W. R. LaFave
Director of Graduate and International Legal Studies: Peter Hay
Correspondence and Information: College of Law, University of Illinois at Urbana-Champaign, 209 Law Building, Champaign, Illinois 61820

FACULTY

Professors: M. W. Benfield, C. H. Bowman, R. G. Cohn, J. J. Costonis, J. E. Cribbet, R. W. Findley, G. T. Frampton, S. B. Goldberg, W. D. Hawkland, P. H. Hay, E. F. Hess, C. Kim, H. D. Krause, W. R. LaFave, P. B. Maggs, J. H. McCord, J. O'Connell, W. Painter, S. J. Plager, C. W. Quick, R. Reisner, R. Simon, V. J. Stone, J. N. Young
Associate Professor: T. D. Morgan
Assistant Professors: K. T. Lopatka, J. E. Nowak
Lecturers: H. A. Baker, S. M. Mamer

Graduate Programs. The College of Law offers a program of graduate work leading to the Master of Laws, Master of Comparative Law, and Doctor of the Science of Law.

Master of Comparative Law. A student whose undergraduate study in law has been in systems based on the Anglo-American common law is eligible to apply for candidacy for the Master of Laws or Doctor of the Science of Law. A foreign lawyer whose prior law study has been in a system which is not based on the Anglo-American common law may, in exceptional cases, be admitted to candidacy for the Master of Laws or Doctor of the Science of Law, or such foreign lawyer may apply for candidacy for the Master of

Comparative Law. The Master of Comparative Law program is designed to develop facility in the comparative method and to prepare a foreign lawyer to deal knowledgeably with Anglo-American problems. Admission standards, as well as residency, course grade average, and thesis requirements, are substantially the same as for the LL.M. and J.S.D. programs.

Master of Laws and Doctor of the Science of Law. For admission, an applicant must have received a first degree in law from a law school which has graduation requirements substantially the same as the University of Illinois College of Law and must present evidence of ability to do satisfactory work at the graduate level. A candidate for the Master of Laws must have a grade-point average of at least 4.0 in all law work previously undertaken. A student who is a candidate for the degree of Doctor of the Science of Law is normally required to have a grade-point average of 4.0 in all law work previously undertaken, and also to present evidence of the ability to do independent research; the latter requirement may be met by the submission of satisfactory legal writing done while the applicant was a candidate for the Juris Doctor (or equivalent degree), or subsequent to the receipt of that degree.

One academic year in residence is required of a candidate for an advanced degree. The programs consist of course work and research which have been approved by the committee on graduate study of the College of Law, comprising at least eight units of graduate work of which at least two for the master's degree and four for the doctor's degree must be in research. In addition to the course work and research, a thesis is required. For the master's degree, the thesis may be completed during the year in residence. For the doctor's degree, the thesis must be submitted not less than one year nor more than five years after the completion of the residence requirements, and the candidate must pass an oral examination before a committee of the faculty. The candidate for the Master of Laws or for the Master of Comparative Law must secure an average of 3.5 in graduate law courses; the candidate for the Doctor of the Science of Law, an average of 4.0.

Financial Aid. The College of Law offers seven teaching assistantships to students whose backgrounds have been in the Anglo-American common law system and four teaching assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition and fees is available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by January 1.

LIBRARY SCIENCE

Director of the Graduate School of Library Science: H. Goldhor
Correspondence and Information: Graduate School of Library Science, University of Illinois at Urbana-Champaign, 329 Library, Urbana, Illinois 61801

FACULTY

Professors: G. S. Bonn, H. Goldhor, D. W. Krummel, F. W. Lancaster, R. E. Stevens, M. E. Williams
Associate Professors: W. C. Allen, J. L. Divilbiss, K. L. Henderson, C. E. Thomassen
Assistant Professors: R. E. Brown, F. A. Schlipf, L. M. Wert, L. R. Wilkens

Graduate Programs. The purpose of the Graduate School of Library Science is to prepare men and women for careers as professional librarians in all types of libraries. Programs of study may be followed leading to the Master of Science and Doctor of Philosophy in Library Science, Certificate of Advanced Study in Librarianship, and Doctor of Library Science.

Admission and Aid. In addition to the Graduate College requirements, applicants to all degree programs must submit scores on the Aptitude Test of the Graduate Record Examination taken within the last five years. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. At least one summer and two semesters in residence, or the equivalent, are required to earn the master's degree. It is desirable for applicants to have some library work experience and two years of college-level study of any foreign language. Each student's program of study, adapted to his particular needs and purposes, is planned in consultation with a faculty adviser at the time of original registration and thereafter.

Certificate of Advanced Study. This program is open to those who hold a master's degree in librarianship from an accredited library school and who have a minimum of two years of acceptable professional library experience since receiving the degree. Applicants for this degree must have maintained a grade-point average of at least 4.0 in the master's program. The certificate is awarded upon the successful completion of eight units of graduate course work. Of the eight units, at least half must be in library science.

Doctor of Philosophy and Doctor of Library Science. Applicants to these programs must meet the following requirements: master's degree in library science from an accredited library school with a 4.0 grade-point average, two years of acceptable full-time library work experience since receipt of the master's degree, letters of recommendation from three people (including a library work supervisor), and an interview with two or more members of the doctoral committee of the faculty. It takes a doctoral student at least three years of full-time study to earn the degree. Preference is given to those applicants for admission who expect to stay in the program continuously until they finish. In no case may a candidate have more than seven years in which to earn a doctorate.

LIFE SCIENCES

(Including Botany, Entomology, Microbiology, Physiology and Biophysics, and Zoology)

Correspondence and Information: School of Life Sciences, University of Illinois at Urbana-Champaign, 387 Morrill Hall, Urbana, Illinois 61801

Graduate Programs. The School of Life Sciences includes the Departments of Botany, Entomology, Microbiology, Physiology and Biophysics, and Zoology. Study programs leading to the graduate degrees of Master of Science and Doctor of Philosophy exist in each of the departments and are described in detail in the following pages. Interdepartmental study programs leading to advanced degrees in cell biology and virology, environmental biology, neural and behavioral biology, and plant physiology are administered within the school. The school also participates with other departments of the University in offering the Ph.D. program in genetics. See page 77.

Admission and Aid. Applicants who desire to enter any of the graduate study programs are usually required to have earned an admission average of at least 4.0. In certain programs, applicants with an average between 3.5 and 4.0 are considered by a special committee.

Support for graduate training is available in the form of teaching or research assistantships and University fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department, or for interdepartmental study programs from the School of Life Sciences.

INTERDEPARTMENTAL STUDY PROGRAM

Master of Science in the Teaching of the Biological Sciences and General Science. This degree is intended for persons planning to enter the teaching profession or who presently are teaching biology or general science in junior high school, high school, or junior college. It is offered upon the completion of the fifth year in the teacher-education curriculum in biological and general science or upon completion of eight units of advanced credit (outlined below) and certification. For admission to this program, students must have an admission average of at least 3.75.

Candidates for the Master of Science in the Teaching of the Biological Sciences and General Science must earn four units in biological sciences, two units in education (see page 28), and two units in electives. Electives may be in the biological sciences, education, or in exceptional cases, other fields. A course in biological chemistry is strongly advised. Students who are preparing for high school teaching and who are not yet certified must fulfill state certification requirements. The adviser for candidates for this degree is Professor Alan Haney, 401 Natural History Building.

Master of Science in Biology. This program is designed for individuals who do not wish to limit their training to a single area of biology. Students whose interests fall into a specific area of biology should apply directly to the relevant department or program.

Admission requires an admission average of at least 4.0. Applicants with a grade-point average of 3.75 to 4.0 will be considered if their average in all biology, chemistry, physics, and mathematics courses is 4.0 or higher. All applicants must outline their educational objectives in a brief statement and must, in addition, submit three letters of recommendation. Although no specific undergraduate courses are required for admission to this curriculum, a year of physics, a course in organic chemistry, and a semester of calculus or statistics must be completed before a degree is granted. Preference is given to those candidates who have already completed most of these courses.

Candidates for the degree should obtain a broad, basic training in biology including aspects of cellular, genetic, organismic, and population biology. Of the eight units required for the degree, at least three units must be taken in 400-level courses. A thesis is not required, but a research report covering at least one unit of individual problem work must be included. A comprehensive examination may be required of all candidates.

Doctor of Philosophy in Biology. The School of Life Sciences offers the doctorate in several interdepartmental areas: cell biology and virology, ecology, neural and behavioral biology, and plant physiology. Entrance requirements in addition to those listed for the Master of Science include background training in general biology, physics, biochemistry, and calculus; deficiencies in these areas may be remedied during the first year of graduate study. Programs are designed to suit individual needs in consultation with advisers.

Students who have been accepted for one of these programs may select any faculty member in the School of Life Sciences, or an appropriate member of a cooperating department as a major adviser. Additional information may be obtained from the School of Life Sciences. Descriptions of the area programs are given below.

AREAS OF SPECIALIZATION

Cell Biology and Virology. The cell biology and virology program emphasizes molecular mechanisms and is therefore addressed to students who have acquired or wish to acquire a strong background in chemistry. Areas of research open to students in this program include cytochemistry, biochemistry of subcellular systems, cellular differentiation, intercellular regulation of meiosis and mitosis, circadian rhythms, cellular genetics, and virology.

Ecology. The ecology program is an interdepartmental approach to the study of the basic interrelationships between organisms and their environment, and the structure and function of ecosystems. Areas of specialization include physiological, population, community, systems, and evolutionary ecology.

Neural and Behavioral Biology. This is a multidisciplinary program with staff members from psychology, physiology, biochemistry, ethology, and biophysics. Research areas include neurochemistry, animal behavior, cybernetics, comparative and mammalian central nervous physiology, cellular neurobiology, and physiological psychology.

Plant Physiology. Plant physiology is an interdepartmental area of specialization coordinated under the biology program. The program is staffed by plant physiologists from the five plant science departments; agronomy, botany, forestry, horticulture, and plant pathology. Thesis research can be conducted in any of these departments. Areas of research include photosynthesis, respiration, membrane transport, nitrogen metabolism, hormones and nucleic acids, herbicide action, water relations, and environmental physiology. In addition to plant physiology, students are required to complete courses in biochemistry and physical chemistry.

Botany

Head of the Department: John B. Hanson
Associate Head: Govindjee
Correspondence and Information: Associate Head of the Department of Botany, University of Illinois at Urbana-Champaign, 289 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: L. M. Black, J. S. Boyer, J. M. J. deWet, Govindjee, J. B. Hanson, J. R. Laughnan, J. F. Nance, T. L. Phillips, D. P. Rogers, D. M. Steffensen
Associate Professors: F. A. Bazzaz, Z. B. Carothers, D. B. Dickinson, L. R. Hoffman, R. MacLeod, M. L. Sargent, R. W. Tuveson
Assistant Professors: C. J. Arntzen, A. W. Haney, T. E. Lockwood, D. S. Seigler, C. A. Shearer, L. N. Vanderhoef

Graduate Programs. The Department of Botany offers graduate work leading to the Master of Science and Doctor of Philosophy. It also participates in interdepartmental study programs leading to doctoral degrees in cell biology and virology, ecology, genetics, and plant physiology.

Areas of specialization available within the department include: anatomy; cytology development; ecology; genetics, mycology; paleobotany; photosynthesis; phycology; physiology; systematics; and virology. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization, and a knowledge of the principles of ecology, genetics, morphology, pathology, physiology, and systematics is of great importance.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Graduate Record Examination scores are required. Applicants should have an admission average of 4.0, but those with averages slightly below 4.0 are also considered.

Master of Science. Candidates for the M.S. are expected to fulfill the requirements of the Graduate College, and to broaden and deepen their training in a program of course work agreed upon with a faculty adviser. A thesis may be required at the option of the candidate's adviser.

Doctor of Philosophy. Candidates for the doctorate are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser.

As each student nears completion of the first eight units of graduate study, three or more faculty members (other than the student's adviser) who are expected to serve on the Ph.D. preliminary examination committee evaluate the student's progress. These committee members have the responsibility of making recommendations to the student and adviser on whether the student should be allowed to continue for the Ph.D., and on the content of the remaining portion of the student's graduate program. Candidates who enter with a master's degree from another institution are required to meet with their committee members as soon as possible after they have chosen an adviser.

For the Ph.D. the department requires a minimum of one foreign language, ordinarily chosen from the following: French, German, Latin, Russian, or Spanish. The adviser may require more than one foreign language, depending on the research literature in the candidate's field of specialization. The candidate may satisfy the minimal departmental requirement as follows: two years of college credit or three years of high school credit in the language, completion of the reading course with an A or B grade, or a score in the Educational Testing Service language examination approximately equivalent to the sixtieth percentile. Any language requirement additional to the minimal departmental requirement need not be completed before taking the doctoral preliminary examination.

Entomology

Head of the Department: Joseph R. Larsen
Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: G. Fraenkel, S. Friedman, A. W. Ghent, W. R. Horsfall, E. R. Jaycox, W. E. LaBerge, J. R. Larsen, W. H. Luckmann, R. L. Metcalf, R. B. Selander, L. J. Stannard, J. G. Sternburg, G. P. Waldbauer
Associate Professors: E. G. Macleod, J. H. Willis
Assistant Professors: F. Delcomyn, P. W. Price

Graduate Programs and Admission. The Department of Entomology offers graduate work leading to the Master of Science and Doctor of Philosophy. The requirement for admission is a grade-point average of 4.0, but in special cases applicants with averages below 4.0 will be considered. Previous training in entomology is not necessary. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the physical and biological sciences, mathematics, and the liberal arts.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Science. A candidate for the M.S. is expected to become knowledgeable in entomology through course and field work and to complete a research thesis in an area of interest arrived at in consultation with an adviser. The graduate average required for degree certification is 4.0.

Doctor of Philosophy. A candidate for the Ph.D. must master the general areas of entomology (bionomics, control, morphology, physiology, and taxonomy) and demonstrate professional competence in a specialized area by presenting an acceptable thesis based on original research. Reading proficiency in a foreign language of importance to the area of research, ordinarily German or Russian, is also required. The graduate average required for degree certification is 4.0.

The chief areas of specialization in the department are behavior, bionomics, ecology, economic entomology, medical entomology, morphology, physiology, taxonomy, and toxicology. The facilities of both the department and the State Natural History Survey are available for advanced study in these areas.

Microbiology

Head of the Department: R. D. DeMoss
Correspondence and Information: Department of Microbiology, University of Illinois at Urbana-Champaign, 131 Burrill Hall, Urbana, Illinois 61801

FACULTY

Professors: M. P. Bryant, L. L. Campbell, R. D. DeMoss, J. W. Drake, R. E. Kallio, S. Kaplan, R. C. Meyer, Z. J. Ordal, M. E. Reichmann, C. R. Woese, R. S. Wolfe, M. J. Wolin
Associate Professors: E. W. Voss, J. T. Wachsman
Assistant Professors: D. D. Burke, P. L. Carl, M. G. Gabridge, A. C. Helm, C. L. Hershberger, S. J. Kaufman, J. Konisky, P. R. Starr, M. J. Weber

Graduate Programs. The Department of Microbiology offers graduate work leading to the Master of Science and Doctor of Philosophy. For both degrees, the program provides a strong basic background in microbiology, biochemistry, and genetics. Students completing the program are qualified for positions in academic, industrial, or governmental environments and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Admission and Aid. Students electing microbiology as a major for an advanced degree should have had, in addition to formal training in general biology or microbiology, chemistry through quantitative analysis and organic chemistry, and fifteen hours of physical or biological sciences. Mathematics through calculus is strongly recommended. The admission average is 4.0.

Financial aid is available in the form of fellowships, and waivers of tuition and fees. Employment in the form of teaching assistantships and research assistantships is available to a limited number of students.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees. Study programs are flexible and are dependent upon the experience, interests, and goals of each student.

Cell Biology, Genetics, and Molecular Biology. Candidates in interdisciplinary graduate programs may, with the approval of the appropriate program committee, select certain departmental faculty as research advisers.

Specialization in Molecular Biology. The Department of Microbiology offers an area of specialization in molecular biology. The program is flexible and provides the doctoral candidate with basic training in biology and physical biochemistry. Students electing this area should possess a solid background in physics and mathematics. Details of the curriculum are decided individually, on the basis of the past experience and interests of the student.

Major areas of research interest are: microbial, viral, and molecular genetics; molecular biology; viruses; enzyme localization; enzyme structure and function; immunology; immunochemistry, pathogenic microbiology, rumen microbiology, biochemistry of anaerobic bacteria; mechanisms of pathogenesis; metabolic control; and animal cell culture.

Physiology and Biophysics

Head of the Department: William W. Sleator
Correspondence and Information: Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, 524 Burrill Hall, Urbana, Illinois 61801

FACULTY

Professors: H. W. Ades, J. D. Anderson, L. Barr, D. E. Buetow, E. Donchin, H. S. Ducoff, F. Dunn, C. Gianturco, Govindjee, J. E. Heath, B. A. Hertig, J. R. Larsen, A. V. Nalbandov, C. L. Prosser, W. W. Sleator, H. I. Teigler, A. R. Twardock, H. M. Von Foerster, G. Weber, J. S. Willis, C. R. Woese
Associate Professors: T. G. Ebrey, C. H. Hockman, A. Kokko-Cunningham, S. G. Stolpe, D. C. Sweeney
Assistant Professors: D. J. Barker, J. A. Connor, J. C. Cooley, J. A. Harris, S. I. Helman, E. G. Jakobsson, G. L. Jendrasiak, B. S. Katzenellenbogen, O. D. Sherwood, R. L. Terjung, J. E. Zehr

Graduate Programs. The Master of Science and Doctor of Philosophy degrees are granted both in physiology and biophysics.

PHYSIOLOGY

Admission and Aid. Applicants for graduate study in physiology are screened by an admissions committee. Students should have a broad undergraduate training in physiology, general biology, a premedical course, or a major in chemistry or zoology. Most students admitted in the last two years have had a grade-point average between an A and B. Applicants with average grades somewhat below a B will be considered and may be admitted if their performance shows recent improvement, and if letters of recommendation indicate ability for graduate work. A limited number of fellowships and teaching or research assistantships are available for qualified students.

Master of Science. A master's degree requires eight or more units of graduate work drawn from the offerings of this and other departments. Each student must submit a report based on original research and pass an oral examination administered by the physiology qualifying committee.

Doctor of Philosophy. Every candidate for the Ph.D. is required to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology, as well as a high degree of expertise in an area of specialization. The student is also expected to develop proficiency in other appropriate disciplines, such as biochemistry, physical chemistry, statistics, and the history and philosophy of science. Normally each student is expected to gain a year of experience as a teaching assistant.

The preliminary examination is taken after completion of at least sixteen units of graduate course work, completion of all courses specified by the student's advisory committee, and after satisfying the foreign language requirement. A thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the branches of physiology must be presented to a review committee before the final examination.

BIOPHYSICS

Admission and Aid. The objective of the program in biophysics is to give students sufficient training in physics, chemistry, and biology to enable them to apply the conceptual, instrumental, and mathematical approaches of the physical scientist to the solution of biological problems. The curriculum is designed primarily for students entering with previous training in the physical sciences, but students with a background only in biology may be eligible. Admission requirements are one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics through cal-

culus. In exceptional cases deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0. A limited number of fellowships and teaching or research assistantships are available for qualified students.

Master of Science. To obtain the Master of Science degree, the student must offer at least eight units in biophysics and related subjects including two biophysics core courses. A thesis or examination in a specialized field is also required.

Doctor of Philosophy. A flexible approach is made to curriculum requirements, but an acceptable course program usually includes the following; (1) Physical sciences: mathematics through differential equations; a one-year sequence in physical chemistry, biochemistry with laboratory, classical mechanics, electromagnetic field theory, and elementary quantum mechanics. (2) Biological sciences: three units of graduate course work in one of the major areas of biology, determined by the research interests of the student. (3) Biophysics: satisfactory completion of two biophysics core courses and two additional courses in biophysics (other than research). Other subjects may be taken with the approval of the faculty.

After completion of eight units of course work the student is required to take a qualifying examination for the purpose of diagnosing inadequacies in training. Successful completion of the preliminary examination after at least sixteen units of formal course work admits the student to candidacy for the degree of Doctor of Philosophy. Normally each student is expected to gain one semester of teaching experience. A thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the areas of biophysics must be presented to a review committee a suitable interval prior to the final examination.

Zoology

Associate Heads of the Department: E. M. Banks and E. H. Brown
Correspondence and Information: Department of Zoology, University of Illinois at Urbana-Champaign, 515 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: E. M. Banks, G. W. Bennett, L. L. Getz, A. W. Ghent, B. V. Hall, H. C. Hanson, J. E. Heath, J. Hirsch, D. F. Hoffmeister, J. B. Kitzmiller, F. J. Kruidenier, R. W. Larimore, N. D. Levine, A. V. Nalbandov, D. L. Nanney, C. L. Prosser, G. C. Sanderson, P. W. Smith, R. L. Watterson
Associate Professors: N. E. Alger, E. H. Brown, R. Davenport, T. H. Frazzetta, G. H. Kieffer, M. R. Lee, M. R. Matteson, M. Salmon, H. H. Shoemaker, D. L. Stocum, D. C. Sweeney, G. S. Whitt, M. F. Willson
Assistant Professors: H. W. Ambrose, G. O. Batzli, W. Daniel, A. Gramza, L. Klein, H. V. Leland, I. D. Unzicker

Graduate Programs. The Department of Zoology offers work leading to the degrees of Master of Science and Doctor of Philosophy. Several areas of specialization are available.

Admission and Aid. The required admission average is 4.0. Applicants with grade-point averages below 4.0 but above 3.75 may be considered. Applicants should have completed twenty-five hours of biology, three semesters of college chemistry including biochemistry, mathematics through calculus, and two semesters of physics, or equivalent. Deficiencies may be made up after entry into the graduate program. Knowledge of a foreign language is necessary and the following are recommended: French, German, and Russian.

Master of Science. The Master of Science requires eight units of graduate credit. Many of the courses listed under biology are taught by members of the Department of Zoology. Biology courses may be utilized toward meeting the requirements of degrees in zoology

in the same manner as zoology courses. At the end of the program each student must successfully complete a comprehensive examination and in addition may be required to complete a thesis or a research project.

Doctor of Philosophy. Admission to advanced standing requires the master's degree or the equivalent and a 4.0 average in nonthesis biology courses, and presupposes that the minimum science requirements specified for the master's degree have been met. One course in statistics is required. Additional courses in other areas may be recommended by the adviser or doctoral committee.

LINGUISTICS

(Including Arabic, Modern Greek, Modern Hebrew, Hindi, Swahili, and Yoruba)

Head of the Department: Braj B. Kachru
Correspondence and Information: Department of Linguistics, University of Illinois at Urbana-Champaign, 4088 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. H. D. Allen, E. H. Antonsen, K. O. Aston, J. B. Casagrande, C. L. Dawson, B. B. Kachru, Y. Kachru, H. R. Kahane (emeritus), C-W. Kim, F. K. Lehman, H. Maclay, J. W. Marchand, C. Osgood, I. Rauch, L. Zgusta
Associate Professors: C. C. Cheng, R. Dunatov, F. S. Gladney, G. M. Green, F. M. Jenkins, C. W. Kisseberth, S. Makino, M. Saltarelli, W. R. Zemlin
Assistant Professors: L. F. Bouton, W. B. Dickerson, H. H. Hock, M. J. Kenstowicz, J. Morgan, H. F. W. Stahlke, D. Wanner

Graduate Programs. The Department of Linguistics offers a graduate program leading to the Master of Arts and Doctor of Philosophy. Work toward these degrees is broken down into several specialized areas under the general division of historical, descriptive, theoretical, and applied linguistics; further specialization includes comparative linguistics, historical linguistics, African linguistics, South Asian linguistics, Semitic linguistics, romance linguistics, articulatory and acoustic phonetics, psycholinguistics, mathematical and computational linguistics, sociolinguistics, and stylistics.

Graduate courses are offered in Arabic, Modern Hebrew, Hindi, Modern Greek, Swahili, and Yoruba.

Admission and Aid. Undergraduate preparation for the study of linguistics should include the equivalent of at least three years of foreign language experience; for historical linguistics, a broad background in the humanities and social studies; and for descriptive linguistics, the equivalent of good undergraduate training in mathematics and the sciences. Students applying for admission should have an admission average of at least 4.0. Applications from students with admission averages between 3.5 and 4.0 are considered and admitted in some cases. Financial aid is available to a limited number of students in the form of fellowships, teaching and research assistantships, and waivers of tuition and fees.

Master of Arts. The aim of the master's program is to instruct students in the important areas of linguistics and the methods of linguistic analysis. Candidates for this degree must earn eight units, of which six units must be in linguistics and must include courses in general linguistics, phonetics, syntax, phonology, comparative, and historical linguistics. Specific required course numbers are available in the department. In addition, the student must pass a reading examination in French, German or Russian (or any other language which the student's advisory committee considers important for the academic interests and research of the candidate), pass the comprehensive qualifying examination in general linguistics (and special subjects, if appropriate), and submit a satisfactory master's essay to the department. Admission to the qualifying examination is contingent upon success in the language examination.

Doctor of Philosophy. Admission to candidacy for the Ph.D. normally requires an average of 4.5 or better for all graduate work in linguistics and distinction in passing the comprehensive qualifying examination. Candidates for this degree must complete at least twenty-four units of graduate work, or sixteen units beyond the master's degree. The minimum twenty-four units must include the course requirements listed above for the master's degree (or their equivalent), courses in advanced syntax, advanced phonology, courses in the structure of non-Western languages, and eight units of thesis research. Candidates must also demonstrate proficiency in a second language other than English. However, this second language requirement is made flexible depending on the research interest of the student. The candidate is required to take the preliminary examinations (written and oral) after completion of eight units beyond the master's level. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to two units of credit granted by the host university under this program may be transferred. Students of descriptive linguistics also are urged to establish a vested interest and a firm basic foundation in some particular language family as early as possible in their graduate career. Linguistically oriented courses in related departments may be counted toward the major if approved by the adviser. The head of the department acts as general adviser to each student until the selection of the field of concentration, at which time the student comes under the guidance of an adviser in his special area.

MATHEMATICS

(Including Statistics)

Head of the Department: Paul T. Bateman
Graduate Supervisor: James W. Armstrong
Correspondence and Information: Graduate Supervisor, Graduate Advising Office, Department of Mathematics, University of Illinois at Urbana-Champaign, 259 Altgeld Hall, Urbana, Illinois 61801

FACULTY

Professor: F. R. Albrecht, R. B. Ash, S. B. Bank, R. G. Bartle, P. T. Bateman, E. R. Berkson, R. L. Bishop, C. R. Blyth, W. W. Boone, P. G. Braunfeld, D. L. Burkholder, R. W. Carroll, K. T. Chen, E. C. Dade, M. M. Day, H. G. Diamond, J. L. Doob, R. M. Fossum, C. W. Gear, S. M. Gersten, D. B. Gillies, S. I. Goldberg, J. W. Gray, W. R. G. Haken, M. E. Hamstrom, L. L. Helms, F. E. Hohn, R. P. Jerrard, F. W. Kamber, R. P. Kaufman, F. B. Knight, R. G. Langebartel, D. E. Muller, J. Nievergelt, H. O. Osborn, E. T. Parker, A. L. Peressini, W. Philipp, I. Reiner, N. T. Rothman, J. J. Rotman, L. A. Rubel, E. J. Scott, M. Suzuki, G. Takeuti, T. W. Ting, P. M. Tondeur, H. E. Vaughan, J. H. Walter, R. A. Wijsman, J. Wolfowitz

Associate Professors: J. R. Alexander, Jr., K. I. Appel, J. W. Armstrong, A. Babakhanian, I. D. Berg, B. C. Berndt, R. E. Bohrer, J. W. Brown, W. A. Ferguson, R. L. Finney, G. K. Francis, P. A. Griffith, G. J. Janusz, C. G. Jockusch, S. S. Jogdeo, P. A. Loeb, L. R. McCulloh, T. G. McLaughlin, H. Paley, N. T. Peck, H. A. Porta, R. R. Rao, D. J. S. Robinson, J. E. Schubert, P. E. Schupp, D. R. Sherbert, K. B. Stolarsky, W. F. Stout, J. M. Steinig, J. J. Uhl, Jr., P. M. Weichsel, E. C. Weinberg, J. E. Wetzel, K. G. Witz, W. M. Zaring

Assistant Professors: S. B. Alexander, F. D. Bateman, H. E. Benzinger, Jr., A. J. Berkson, G. A. Converse, R. F. Craggs, C. D. Dade, L. Dornhoff, U. Ejike, E. G. Evans, Jr., A. Fauntleroy, E. W. Gray, H. P. Lotz, L. McLinden, J. B. Miles, C. J. Moreno, E. M. Peck, C. Phillips, I. W. Reiner, K. K. Uhlenbeck, S. V. Ullom

Graduate Programs. The Department of Mathematics offers graduate work leading to the Master of Arts or Master of Science in Mathematics and Doctor of Philosophy in Mathematics, Master of Science in the Teaching of Mathematics, and Master of Arts or Master of Science in Statistics and Doctor of Philosophy in Statistics. Gradute study in areas of applied mathematics is available in conjunction with other departments of the University. See below.

Admission and Aid. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics and have an admission average of at least 4.0. Applications from students whose average is below 4.0 but above 3.5 may be considered if there appear to be exceptional circumstances that warrant such special consideration. Students whose undergraduate training in mathematics is deficient will not be admitted to full standing but may be admitted with deficiencies to be removed during the first year of graduate study. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Statistics. This program of study is for those who wish to concentrate on research in the theory of statistics, and to provide training in the theory and practice of statistical inference from quantitative data. It also provides an appropriate minor for those who wish to develop competence in an area of application of statistics, such as agronomy, biology, chemistry, economics, education, geology, physics, or psychology.

Master's Degree Programs. The various master's degrees offered by the department are designed to be completed in one year of full-time study by students entering on full standing. However, most students find it necessary to devote at least one additional summer or semester to such study. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the graduate supervisor.

Doctoral Degree Programs. Students working toward one of the doctoral degrees usually require from four to six years to complete the requirements. These students must pass the qualifying examination (testing the content of undergraduate courses in abstract and linear algebra and real and complex analysis) and the preliminary examination (testing the content of four areas of graduate mathematics selected by the student and approved by the department), and write a thesis in an area of mathematical research. The time required to complete the thesis is about two years. A reading knowledge of two of the following languages is required: German, French, or Russian.

MATHEMATICS (APPLIED)

Graduate Programs. A wide variety of courses in applied mathematics, covering among others the fields of mechanics of particles and of rigid bodies, the mechanics of continuous media, electromagnetic theory, and mathematical methods, is offered by various graduate departments in the sciences and engineering. A graduate student interested in applied mathematics should register as a major in the appropriate department. In consultation with an adviser a basic course of study should be planned which will serve as preparation for subsequent specialization and research in the theoretical aspects of one or more of the following fields; aerodynamics and hydrodynamics, astronomy, elasticity, and plasticity, electrical theory, mathematics, mathematical meteorology, or the mathematical problems related to digital computer use and design.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: H. H. Korst
Associate Head of the Department: J. W. Bayne
Chairman of the Graduate Committee: S. L. Soo
Correspondence and Information: Chairman of the Graduate Committee, Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign, 144 Mechanical Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: A. L. Addy, J. W. Bayne, E. L. Broghamer, B. T. Chao, J. C. Chato, M. M. Chen, W. L. Chow, L. E. Doyle, G. W. Harper, E. F. Hebrank, J. A. Henry, B. A. Hertig, W. L. Hull, B. G. Jones, H. H. Korst, J. L. Leach, R. J. Martin, L. C. Pigage, E. I. Radzimovsky, F. Seyfarth, S. L. Soo, W. F. Stoecker, K. J. Trigger, R. A. White
Associate Professors: W. E. Bair, A. M. Clausing, H. E. Cook, M. I. Dessouky, R. E. Klein, C. S. Larson, F. A. Morrison, D. H. Offner, C. O. Pedersen, L. D. Savage, Jr., R. P. Strout, J. J. Stukel, J. L. Whisenand
Assistant Professors: C. Cusano, R. E. DeVor, J. E. Greene, G. L. Hogg, J. S. Liebman, S. C. Sorenson

Graduate Programs. The Department of Mechanical and Industrial Engineering offers work leading to the Master of Science in Mechanical Engineering, the Master of Science in Industrial Engineering, and the Doctor of Philosophy in Mechanical Engineering. A student may specialize in any of the major core areas including gas dynamics, heat transfer, thermodynamics, machine design, internal combustion engines, combustion, environmental control, environmental engineering and air pollution controls, hydrodynamics of suspensions, bioengineering, industrial engineering, operations research, controls, and production engineering.

Admission and Aid. The minimum admission average is 4.0. However, those students with an average between 3.60 and 4.0 may be considered after review by a faculty committee for the core area. The Graduate Record Examination is not required by the department. Based upon the previous preparation of the student, one or more prerequisite courses may be specified by the adviser, but the credit may not apply to the degree. For example, those without experience in digital and analog computers may be required to obtain proficiency in these areas. Financial aid is available to a limited number of students in the form of fellowships and traineeships, industrial and University-sponsored fellowships, teaching and research assistantships, and tuition waivers.

Master of Science. A thesis is required, but can be waived for students terminating their studies with the M.S. degree. A total of eight units (including thesis credits) is required. A full-time student can complete this program in an academic year. Those not writing a thesis are required to offer a minimum of nine units of credit. In such cases, the study program includes one or more units of laboratory investigations, since each student is required to show evidence of ability to do independent study.

Doctor of Philosophy. A master's thesis or equivalent is required for all applicants for Ph.D. study. Those students who enter with a master's degree, and who have not written a thesis or equivalent, will be required to register in laboratory investigations during their first semester of residence on the campus for the purpose of demonstrating their ability to do independent research. Qualifying examinations are to be taken during the last semester of master's study. Those from other schools entering with a master's degree must take qualifying examinations no later than the second calendar semester. A total of sixteen units of course work beyond the B.S. degree is a minimum requirement for the Ph.D. degree. In order to be

accepted as a final doctoral candidate, the student must prepare a thesis proposal and take an oral preliminary examination. If successful, the candidate completes the thesis work and takes a final oral examination.

METALLURGY AND MINING ENGINEERING

Head of the Department: C. A. Wert
Correspondence and Information: Head of the Department, Department of Metallurgy and Mining Engineering, University of Illinois at Urbana-Champaign, 201 Metallurgy and Mining Building, Urbana, Illinois 61801

FACULTY

Professors: C. J. Altstetter, P. A. Beck, H. K. Birnbaum, R. W. Bohl, A. J. deWitte, G. Ehrlich, D. S. Lieberman, M. Metzger, E. N. Pugh, B. G. Ricketts, T. J. Rowland, C. M. Wayman, C. A. Wert
Associate Professors: D. Bond, H. E. Cook, F. V. Lawrence, Jr., J. A. Simon
Assistant Professor: J. E. Greene

Graduate Programs. The Department of Metallurgy and Mining Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Metallurgical Engineering and the Master of Science and Doctor of Philosophy in Mining Engineering. The faculty members have a widely varied background of engineering and science, and graduates go into a broad range of industrial, government, and university positions. Close association exists with staff members in other departments having programs in the properties of solids.

Admission and Aid. Graduate students in metallurgical or mining engineering may have undergraduate degrees in a number of disciplines. Graduates with degrees in metallurgy or mining engineering fit into the graduate programs easily, as well as the many graduate students who come from other engineering or science disciplines. Graduates of departments of mechanical engineering, physics, chemistry, and ceramics are represented among our student body. Financial aid is available to qualified students in the form of fellowships, research assistantships, and waivers of tuition and fees.

Master of Science. A candidate for the Master of Science is required to have a minimum of eight units of graduate work, including a thesis. If a petition to waive the thesis is granted, a minimum of nine units of graduate work is required. A thesis is required of candidates who hold research assistantships.

Doctor of Philosophy. Students desiring to work for the Doctor of Philosophy are required to pass the departmental qualifying examination. This oral examination must be taken no later than the end of the first semester after receiving the Master of Science from this department, or after completing an equivalent amount of graduate work.

The minor requirement of the department for the Doctor of Philosophy may be satisfied by taking courses in fields such as ceramics, chemistry, geology, mathematics, theoretical and applied mechanics, nuclear engineering, and physics. Although reading knowledge of a foreign language is helpful, there is no formal requirement.

MUSIC

(Including Music Education and Musicology)

Director of the School of Music: Thomas Fredrickson
Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801

FACULTY

Professors: J. L. Bailey, H. Begian, E. S. Berry, A. M. Carter, W. R. Coggins, R. J. Colwell, H. A. Decker, C. DeLaney, K. Drake, G. M. Duker, B. E. Edlefsen, T. Fredrickson, J. C. Garvey, B. M. Goodman, R. E. Gray, D. Gunsalus, J. Hamilton, C. E. Hamm, T. L. Holden, G. H. Hunter, B. B. Johnston, J. R. Kelly, E. D. Kisinger, E. J. Krolick, C. Leonhard, D. Lloyd, J. Lyke, E. London, A. J. McDowell, J. McKenzie, S. Martirano, W. Miller, B. Nettl, P. S. Pettinga, C. L. Richards, A. L. Ringer, P. Rolland, D. W. Sanders, H. C. Schmitt, H. O. Sexton, R. B. Smith, S. Stravinsky, R. H. Swenson, N. M. Temperley, R. E. Thomas, G. E. Wilson, J. C. Wustman

Associate Professors: J. W. Beauchamp, G. Behague, H. Brün, M. Burdette, F. Crawford, E. L. Dalheim, M. Elyn, R. Hedlund, W. H. Heiles, A. L. Johnson, H. Kellman, D. Kimpton, D. M. Kohut, D. L. Miller, E. Noth, D. T. Perantoni, G. Perich, M. Powell, T. V. Siwe, T. J. Wisniewski, P. Zonn

Assistant Professors: R. Aslanian, G. Berenson, R. Blum, N. Bruce, R. Byrnside, F. Fairchild, V Farmer, J. Forsythe, C. L. Gonzo, J. Melby, Jr., R. Newell, W. W. Olson, R. J. Ray, Jr., J. Shapiro, J. G. Smith, I. Thomas, T. Ward

Graduate Programs. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the M. Mus. degree are musicology; music theory; composition; performance and literature (piano, organ, voice, orchestral instruments); choral music; and vocal accompanying and coaching.

Admission and Aid. Requirements for admission are a Bachelor of Music degree from the University of Illinois, or an equivalent degree from another accredited institution (students holding other degrees may be admitted, but will be expected to make up any deficiencies), and an admission average of 3.5. For those majoring in musicology, the minimum average is 4.0.

Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings.

Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Language Requirements. Applicants in voice are required to have had one year each at the college level, or two years at the high school level, of French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students otherwise admissible must satisfy any language deficiencies.

Entrance Examinations. All prospective candidates for the M. Mus. degree must pass entrance examinations in music history and theory. These examinations are to be given immediately prior to the student's first registration.

Degree Requirements. Candidates for the M. Mus. in theory-composition and in performance and literature must earn at least eight units, including two units at the 400 level in their major field, and one unit in problems and methods. Candidates in performance and literature must earn two units in the music literature course in their major applied area. Electives in music theory, history, and literature, and other music and nonmusic courses will be chosen in consultation with the candidate's graduate

adviser. A graduate recital is required of all candidates in performance and literature. However, the recital required of voice majors may, by collective action of the voice division, be waived. Candidates in musicology and theory must write a thesis, for which two units of credit are given.

Doctor of Musical Arts. The fields of specialization for the D.M.A. degree are composition; piano; organ; choral music; voice; violin; viola; cello; wind instruments; and percussion instruments.

Admission. Prerequisites for admission are: (1) The M. Mus. degree from the University of Illinois, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above. (2) A high level of proficiency in composition or performance. Candidates in composition must submit original scores for review. Candidates in performance and literature must pass a qualifying audition or submit satisfactory recordings. (3) Appropriate experience in ensemble playing and/or score reading. (4) The successful completion of approximately thirty-two semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of six hours in history, and six hours in literature or philosophy. Candidates in voice must have fulfilled all foreign language requirements considered as prerequisites for the M. Mus. (See page 102.) (5) The successful completion of entrance examinations in music history and theory for the M. Mus.

Degree Requirements. Candidates must earn a minimum of sixteen units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interests, and abilities; it will ordinarily include a minimum of three units in the major field of specialization, two units in advanced music literature courses, and two units in a minor field.

Language Requirements. All candidates will be required to demonstrate proficiency in at least one language other than English. Each division may specify which language is required or may require proficiency in more than one language. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition, and performance and literature, three units are applied to a special doctoral project. Composers must produce a large-scale original score, while performers must demonstrate comprehensive repertory study in the form of two solo recitals, or one solo recital and two of the following options: a concerto; a major operatic or oratorio role; a chamber music program; a lecture-recital; or the preparation and, when appropriate, conducting of a concert by an instrumental or vocal ensemble.

Two units are devoted to the writing of a thesis related to the student's special interests. In the field of choral music four units are counted toward the thesis, while one unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory. Alternatives to the thesis requirement are under consideration.

Doctor of Philosophy in Musicology. The Ph.D. in musicology is intended for those whose interests lie in research in the history of music, ethnomusicology, theory of music, and psychology and philosophy of music.

Admission. Prerequisites for admission are: (1) The M.Mus. in musicology from the University of Illinois, or an equivalent degree from another accredited institution. (2) A minimum of thirty-two semester hours in the liberal arts and sciences, normally including general history, philosophy, and literature. (3) The successful completion of entrance examinations in music history and theory for the M.Mus.

Degree Requirements. A minimum of sixteen units of credit must be earned beyond the requirements of the master's degree, including at least two units in the seminar in musicology. Two units are normally devoted to a nonmusic minor determined in accordance with the student's particular research plans. No more than two units may be earned in applied music.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester 400-level reading course with a grade of at least B, or by satisfactory test scores.

Thesis. Eight of the total of sixteen units are normally devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 3.5. Candidates for this degree must earn a minimum of four units in music courses, two units in education courses, and two units of electives. One of the four units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in the major performing medium during the registration period of their first session in residence. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

An alternate program for Bachelor of Music graduates requires four units in music courses, one unit in educational psychology, one unit in history and philosophy of education, two units of electives, and nine hours of undergraduate professional education including six hours in student teaching. Enrollment in a summer session contiguous to the year of residence is required.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have completed satisfactorily two years of professional employment in music education. At first registration, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of eight units beyond the master's degree is required, including one unit in music education courses and one unit in educational psychology. Students not holding a valid teaching certificate in music must fulfill certification requirements of the state in which they are employed.

Doctor of Education in Music Education. This program, offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music or music education. Admission is determined by examinations in music history, music theory, music education and applied music; personal interviews; record of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies Test should accompany his application for admission.

Program. At least sixteen units of work beyond the master's degree are required, including six units in music courses and six units in education courses. No more than two units of credit in applied music may be counted toward the degree. A thesis is required. It may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled by full-time study in two consecutive semesters or in one semester, a contiguous summer session, and one additional summer session.

NUCLEAR ENGINEERING

Chairman of the Program: Marvin E. Wyman
Correspondence and Information: Nuclear Engineering Office, University of Illinois at Urbana-Champaign, 214 Nuclear Engineering Laboratory, Urbana, Illinois 61801

FACULTY

Professors: F. T. Adler, R. A. Axford, R. W. Bohl, A. P. Boresi, B. T. Chao, A. B. Chilton, G. A. Costello, H. S. Ducoff, B. B. Ewing, O. L. Gaddy, L. Goldstein, D. F. Hang, C. D. Hendricks, J. P. Hummel, B. G. Jones, J. S. Koehler, R. J. Martin, M. S. McVay, G. H. Miley, J. E. Pearson, J. T. Verdeyen, M. E. Wyman
Associate Professors: B. E. Cherrington, J. J. Dorning, H. Merkelo, D. R. O'Boyle, B. W. Wehring
Assistant Professors: P. B. Bleiweis, P. S. Pickard

Graduate Programs. Nuclear engineering offers work leading to the Master of Science and Doctor of Philosophy and provides courses and research facilities for doctoral candidates in nuclear engineering and related fields.

Admission and Aid. The program in nuclear engineering is open to all graduates in engineering, mathematics, and the physical sciences who have an admission average of at least 4.0. Students with grade-point averages below 4.0 but above 3.5 are considered if their applications are supported by a letter explaining the circumstances. It is recommended that they also submit letters of reference and information as to their rank in class. Undergraduate courses in differential equations, advanced calculus, and atomic physics are required as background for the nuclear engineering program. A student may be admitted before completion of these three prerequisites, but must then allow an additional semester or summer of study for the completion of the master's degree. Financial aid is usually available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Degree Requirements. The general requirements of the Graduate College must be met for either degree. A candidate for the M.S. degree who does not submit a thesis must complete nine units of graduate work.

Facilities. The Illinois Advanced TRIGA reactor is located on campus for research and teaching in nuclear engineering and operates at a steady state of power of 1.5 megawatts. The reactor can be pulsed to lower levels of 6,000 megawatts for special studies. Teaching facilities include a nuclear metallurgy laboratory; a radiochemistry and nuclear instrumentation laboratory; a heat transfer, fluid flow, and turbulence laboratory; several subcritical natural uranium assemblies; two neutron generators; a radiation shielding laboratory; a direct energy conversion laboratory; and a thermonuclear systems laboratory.

NUTRITIONAL SCIENCES

Chairman of the Committee on Nutritional Sciences: H. H. Draper
Correspondence and Information: Nutritional Sciences Program, University of Illinois at Urbana-Champaign, 567 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: C. L. Davis, B. L. Larson, H. H. Draper, R. M. Forbes, K. E. Harshbarger, F. A. Kummerow, S. P. Mistry, T. Nishida, E. G. Perkins
Associate Professors: D. H. Baker, B. E. Haskell, P. V. Johnston
Assistant Professors: D. E. Bauman, J. L. Robinson

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science and Doctor of Philosophy in Nutritional Sciences is offered under the auspices of the Committee on Nutritional Sciences. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes, animals, and man; nutritional biochemistry; the chemistry of nutritional compounds; and the epidemiology of nutritional diseases.

Admission and Aid. Applicants are expected to have an admission average of 4.0 and sound basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study. Financial assistance is available in the form of assistantships and fellowships.

Master of Science. Requirements for the M.S. include general biochemistry, an advanced course in human nutrition, two semesters of seminar, and completion of a satisfactory thesis. Additional courses are available in such diverse subjects as laboratory techniques in animal biochemistry, instrumental analysis, foods and nutrition, lipid metabolism, nutritional biochemistry, human and animal nutrition, food science, and the social sciences related to nutrition.

Doctor of Philosophy. In addition to achieving at least a 4.0 average in formal course work, Ph.D. students are required to take a comprehensive oral preliminary examination and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to demonstrate competence in English.

PHILOSOPHY

Chairman of the Department: J. D. Wallace
Correspondence and Information: Director of Graduate Studies, Philosophy Department, University of Illinois at Urbana-Champaign, 105 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: C. E. Caton, B. J. Diggs, D. Shapere, D. S. Shawayder, H. M. Tiebout, A. R. Turquette, J. D. Wallace, F. L. Will
Associate Professors: H. S. Chandler, R. L. Schacht
Assistant Professors: L. D. Gordon, P. G. Hugly, A. Melnick, R. Monk, F. W. Neely, T. J. Nickles, R. G. Wengert

Graduate Programs. The normal program of graduate study for philosophy majors is directed toward the Doctor of Philosophy, but a limited number of students who wish to work for the Master of Arts is admitted. Graduate students majoring in other fields who wish to offer philosophy as a minor, or to include philosophy in their programs in a less formal way, are encouraged to consult with members of the graduate faculty in philosophy in order to plan appropriate courses of study.

Admission and Aid. The normal requirement for admission is an admission average of 4.0. In special cases applicants are admitted with averages lower than 4.0, but in no case where the average is less than 3.75.

Each student should have had a course in elementary logic, a course in the theory of knowledge, a course in ethics, and a general course in the history of philosophy (the main figures of ancient and modern philosophy). Students deficient in one or more of these areas may be admitted with deficiencies to be removed by taking courses recommended by the departmental director of graduate studies after consultation with the student.

All applications for admission only, as well as applications for admission and financial aid, must be supported by three letters of recommendation. The letters should be in each case from persons qualified to speak of the candidate's aptitude for graduate study in philosophy. Candidates are asked to have these letters transmitted directly to the committee on Admissions and Financial Aid of the Department of Philosophy.

All applicants for admission are required to take the General Aptitude portion of the Graduate Record Examination and to have their scores transmitted to the department. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts. Each student who has passed his preliminary examination for the Ph.D. is automatically qualified by the department to receive the A.M. This degree may also be earned by completing one full year of residence study in philosophy at the University of Illinois, including six of the eight units required for the degree, submitting a substantial essay, and passing an oral examination on the essay given by a committee appointed by the chairman of the department. A degree earned in this way is normally a terminal one. A minimum grade-point average of 4.0 is required for this degree.

Doctor of Philosophy. In the preliminary examination, required of all candidates, each student is required to demonstrate a basic competence in the following four broad areas of philosophy: history of philosophy, theory of knowledge, metaphysics, and ethics and value theory.

Candidates are not generally required to offer work in a minor field outside the department. However, in those cases where advanced study in philosophy would be strengthened by the inclusion of work in a related field, the student may be advised to include such work in the courses taken to satisfy the requirements for the degree. The amount of such work is limited to two units, unless the student wishes the work to count as an extradepartmental minor. Then the minimum work accepted is two units, the maximum four. A minimum grade-point average of 4.0 is required for this degree.

Prior to taking the preliminary examination each candidate is required to demonstrate a basic competence in mathematical logic. This may be done by passing an approved course in the subject or passing a proficiency examination administered by the department.

Subsequent to the preliminary examination, the student must submit an acceptable dissertation in one of the above four areas of philosophical research and pass a final examination on the dissertation. The acceptability of the dissertation is judged, and the final examination administered, by the student's doctoral committee.

Concentration in the Area of History and Philosophy of Science. The Departments of History and Philosophy jointly offer, for work toward the A.M. and Ph.D. degrees, a special area of concentration in History and Philosophy of Science. Students interested in this program will enroll in, and receive their degrees from, either the history or the philosophy department, depending on the focus of their interests. Undergraduate background requirements for admission to the program are flexible; although an undergraduate concentration in either history or philosophy is normally desirable, so also is a strong background in science, and students with such background, but only weak training in history or philosophy, will be considered for admission. The course requirements for admission to the Department of Philosophy and the means of remedying deficiencies in undergraduate training, as stated in the second paragraph of the section entitled Admission and Aid above, are not applicable to students applying to this program. The admission is the same as that stated for each of the two departments, as is the information to be submitted with each application for admission. Further information is available from the Department of Philosophy.

PHYSICAL EDUCATION

Head of the Department: Rollin G. Wright
Correspondence and Information: Graduate Department of Physical Education, University of Illinois at Urbana-Champaign, 120 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professors: A. T. Cheska, A. W. Hubbard, G. Lueschen, B. H. Massey, D. O. Matthews, K. J. McCristal, A. C. Moore, R. H. Pohndorf, R. E. Shelton, M. Thompson, R. G. Wright
Associate Professors: R. A. Boileau, J. Davenport, C. Dillman, M. Harris, P. Hill, A. Hoyman, W. Johnson, R. Keller, R. Martens, J. E. Razor, M. Souder, M. Trekell, O. G. Young
Assistant Professors: D. E. Arnold, J. W. Bell, W. Considine, H. Deutsch, F. Grebner, K. Kahrs, T. Lohman, J. Misner, N. Parker, G. Roberts, M. Slaughter, J. Teeple, B. H. Williams

Graduate Programs. The Department of Physical Education offers graduate programs leading to the Master of Science in Physical Education designed for teaching and research competency; the Master of Science in the Teaching of Physical Education, emphasizing teaching competency; and the Doctor of Philosophy in Physical Education, designed for advanced scholarly research.

Admission and Aid. The admission requirements for the Master of Science and the Master of Science in the Teaching of Physical Education programs include: an admission average of 4.0; scores on the Miller Analogies Test and/or on the aptitude portion of the Graduate Record Examination; and three letters of recommendation. The admission requirements for the Doctor of Philosophy programs are basically the same with the following additions: graduation from an accredited master's program and a minimum average of 4.5 for graduate work completed.

The most common type of financial assistance is provided in the form of teaching assistantships. Assistantships may vary with respect to percentage of appointment and the amount of the stipend. Fellowships and research assistantships are also available; applicants with outstanding academic credentials are considered for these awards.

Master of Science. A candidate for the Master of Science must complete eight units, four in physical education and two in another discipline. Two units of credit are earned while writing the thesis. Typically a full-time student can receive this degree in one academic year plus one summer session.

Master of Science in the Teaching of Physical Education. This program is primarily an advanced program for increasing teaching proficiency. Candidates for this degree must complete eight units: four units in physical education, two units in education, and two units of thesis credit. Typically a full-time student can receive this degree in one academic year plus one summer session.

Doctor of Philosophy. The minimum requirements for the degree of Doctor of Philosophy are as follows: eight units of course work beyond the master's degree (four in physical education and four in another discipline); the ability to translate two foreign languages, or to read, write, and converse satisfactorily in one (two additional approved graduate courses may be substituted for each of the two required foreign languages); successful completion of the preliminary examination; eight units of thesis research; and successful completion of the final examination.

PHYSICAL SCIENCES

Correspondence and Information: Professor D. H. Secrest, University of Illinois at Urbana-Champaign, 155 Noyes Laboratory, Urbana, Illinois 61801

Graduate Programs. Two degree programs in physical science, one leading to the Master of Science in the Physical Sciences and the other leading to the Master of Science in the Teaching of Physical Sciences are offered for active or intended secondary school teachers. Students applying for admission must have an admission average of at least 3.5.

A special program leading to the Master of Science in the Physical Sciences is available to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this program are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa. No thesis is required, and all courses in physics, chemistry, geology, astronomy, and mathematics which normally give graduate credit are acceptable toward the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus, for which calculus is a prerequisite. In addition, the requirements for teacher certification must have been met.

Candidates for the Master of Science in the Teaching of the Physical Sciences, which is distinct from the program described above, must earn four units in the physical sciences, two units in education (see page 28), and two units in electives. The courses in the physical sciences and the electives must be selected with the approval of the adviser. The electives may be in the physical sciences, in education, or in exceptional cases, in other fields. The student must also have met the requirements for teacher certification.

PHYSICS

Head of the Department: R. O. Simmons

Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois at Urbana-Champaign, Physics Building, Urbana, Illinois 61801

FACULTY

Professors: A. Abashian, F. T. Adler, D. Alpert, A. C. Anderson, G. Ascoli, P. Axel, J. Bardeen, G. A. Baym, S. A. Bowhill, R. M. Brown, M. K. Brussel, P. G. Debrunner, H. G. Drickamer, G. Ehrlich, C. P. Flynn, H. Frauenfelder, D. M. Ginsberg, A. V. Granato, P. Handler, A. O. Hanson, N. Holonyak, J. P. Hummel, I. Iben, M. V. Klein, J. S. Koehler, L. J. Koester, U. Kruse, L. S. Lavatelli, D. Lazarus, E. M. Lyman, D. E. Mapother, R. J. Maurer, W. L. McMillan, Y. Ogura, T. A. O'Halloran, C. J. Pethick, D. Pines, M. J. Raether, D. G. Ravenhall, C. S. Robinson, G. A. Russell, C. T. Sah, R. D. Sard, C. B. Satterthwaite, R. O. Simmons, C. P. Slichter, J. H. Smith, J. N. Snyder, H. J. Stapleton, J. D. Sullivan, A. Wattenberg, W. S. Williams, M. Wortis, J. A. Wright, H. W. Wyld, M. E. Wyman

Associate Professors: J. H. Cahn, S. J. Chang, J. D. Dow, B. I. Eisenstein, L. E. Holloway, E. A. Jackson, L. M. Jones, T. B. W. Kirk, A. B. Kunz, J. M. Mochel, F. M. Propst, M. B. Salamon, R. L. Schult, J. D. Stack, D. C. Sutton

Assistant Professors: H. Bohmer, R. K. Crawford, M. F. Gormley, F. K. Lamb, B. A. Sherwood, W. D. Watson

Graduate Programs. The Department of Physics offers graduate work leading to the Master of Science, the Doctor of Philosophy, and the Master of Science in the Teaching of Physics.

There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, and surface physics; the properties of liquid helium; and plasma physics and aeronomy. Graduate study in areas of applied physics is available in conjunction with other departments in the University.

Admission and Aid. Requirements for admission to the graduate programs in physics are twenty hours of physics, including a semester of intermediate theoretical mechanics; two semesters of intermediate electricity and magnetism or the equivalent, and excluding courses in general physics; and an admission average of 3.75. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study. A wide variety of fellowships and assistantships is available to outstanding students.

Master of Science and Master of Science in the Teaching of Physics. These programs require eight units of graduate courses, and are usually completed in one year of full-time study by students entering on full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the Graduate Advising Office of the Department of Physics.

Doctor of Philosophy. Students working for the Ph.D. usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following two years.

Departmental requirements for the Doctor of Philosophy, in addition to the general requirements of the Graduate College, are described in a pamphlet which may be obtained from the Graduate Advising Office of the Department of Physics.

Related Programs. For information concerning applied physics (mathematics) see page 99; for information concerning astronomy, see page 49; for information concerning atmospheric science, see page 50; for information about biophysics, see page 95. A doctoral program in chemical physics is described on page 54.

PLANT PATHOLOGY

Head of the Department: Richard E. Ford
Correspondence and Information: Head of the Department of Plant Pathology, University of Illinois at Urbana-Champaign, 218 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: L. M. Black, J. C. Carter, R. E. Ford, J. L. Forsberg, J. W. Gerdemann, D. Gottlieb, R. D. Neely, A. L. Hooker, M. B. Linn, E. B. Himelick, M. C. Shurtleff, J. B. Sinclair
Associate Professors: D. W. Chamberlain, J. D. Paxton, P. D. Shaw
Assistant Professors: D. I. Edwards, L. E. Gray, W. Hartstirn, B. J. Jacobsen, H. Jedlinski, R. B. Malek, G. M. Milbrath, S. M. Ries, D. F. Schoeneweiss

Graduate Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the Master of Science and Doctor of Philosophy degrees. All students are required to present themselves for an oral examination

in plant pathology before their Program of Study Committee after the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; fungicides; antibiotics; physiology of fungi; biochemistry of plant diseases; disease resistance; etiology; epiphytology; soil-borne diseases; mycorrhiza; and variability in plant pathogens.

Admission and Aid. Applicants for graduate study are screened by a departmental admissions committee and normally are admitted with an admission average of 4.0. Applicants with an average above 3.75 may be admitted under special circumstances. Financial aid is available to degree candidates in the form of fellowships, research and teaching assistantships (half-time), and waivers of tuition and fees.

Master of Science. A candidate for the Master of Science must complete eight units of credit including the presentation of an acceptable thesis, and pass an oral examination. Credit in equivalent courses earned at other institutions may be accepted, at the discretion of the department head. The candidate must maintain an average of 4.0 for the master's program.

Doctor of Philosophy. Students working toward the Ph.D. usually require three to five additional years beyond the master's. Eight units of course work, including required courses, must be completed beyond the master's to qualify for the preliminary examination. An oral preliminary examination before five faculty members, including three from the department and two from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable dissertation. A grade-point average of at least 4.0 is required for the Ph.D. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

POLITICAL SCIENCE

Head of the Department: E. A. Kolodziej
Correspondence and Information: Department of Political Science, University of Illinois at Urbana-Champaign, 361 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: M. Davis, S. K. Gove, E. A. Kolodziej, E. G. Lewis, R. L. Merritt, P. Monypenny, S. S. Nagel, J. W. Peltason, R. E. Scott, L. Seligman, G. T. Yu
Associate Professors: P. G. Bock, I. H. Carmen, B. Carroll, S. P. Cohen, S. A. Douglas, A. B. Fields, B. Glad, M. Hobbs, J. Pisciotte, M. G. Weinbaum, M. E. Weinstein
Assistant Professors: S. Blutza, R. S. Byars, F. S. Coombs, S. Hansen, D. E. McHenry, M. Preston, R. Rothman, B. Rundquist

Graduate Programs. The Department of Political Science offers work leading to the degrees of Master of Arts and Doctor of Philosophy. Graduate work is conducted in the following special fields: American government and politics, comparative government and politics, international law and relations; political behavior, and political theory.

Admission and Aid. Admission to graduate work in political science normally requires an undergraduate average of at least 4.0. The student must also have had a minimum of twenty hours of undergraduate work in political science, economics, finance,

sociology, or history, not less than twelve hours of which must have been in political science, which may include three hours in constitutional history. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts. Requirements for the master's degree include eight units of credit, and an acceptable thesis or substantial research essay in a departmental course.

The department also administers a program leading to the Master of Arts in Public Administration. This program is matched to the individual needs and objectives of students. Programs for students without public service employment usually incorporate an internship of at least three months.

Doctor of Philosophy. Students planning to continue toward the doctorate must be admitted to candidacy. Such students should apply for admission to candidacy in their third semester of graduate training or after the completion of eight units of graduate work. The A.M. degree is not a prerequisite to working toward the doctorate, but admission to candidacy is.

A doctoral candidate must show familiarity with all the fields of the discipline by sucessfully completing one course in each of the five areas. Competence must be demonstrated either in foreign languages, or in quantitative methods and analysis, or in a combination of these as appropriate to the candidate's research interests. Requirements also include passing a written and oral preliminary examination after completion of sixteen units. The preliminary examination tests competence in two areas of political science and in one outside minor area. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Further information on all these programs may be obtained by writing directly to the department.

POPULATION STUDIES

Correspondence and Information: Paul Handler, Chairman, Population Studies Committee, University of Illinois at Urbana-Champaign, 312 Materials Research Laboratory, Urbana, Illinois 61801

Graduate Programs. The social implications of population growth are of considerable interest to many students. Since the approach to this area of study is multidisciplinary, those students who wish to focus part of their programs of study on this issue will be taking courses offered by several departments, including those available in the social sciences, the life sciences, and mathematics.

PSYCHOLOGY

Head of the Department: Joseph E. McGrath
Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois at Urbana-Champaign, 305 Psychology Building, Champaign, Illinois 61820

FACULTY

Professors: J. A. Adams, H. W. Ades, R. C. Anderson, E. M. Banks, S. W. Bijou, R. B. Cattell, J. B. Cohen, F. Costin, J. H. Davis, E. Donchin, D. E. Dulany, C. W. Eriksen, T. N. Ewing, M. Fishbein, R. E. Flexman, W. M. Gilbert, L. R. Goulet, H. W. Hake, R. Hamlin, K. Hill, J. Hirsch, C. O. Hopkins, C. L. Hulin, L. G.

Humphreys, J. McV. Hunt, F. Kanfer, W. E. Kappauf, L. H. Lanier, P. R. Laughlin, J. E. McGrath, O. H. Mowrer, C. E. Osgood, G. L. Paul, D. R. Peterson, K. E. Renner, S. N. Roscoe, R. L. Sprague, M. M. Tatsuoka, P. Teitelbaum, H. C. Triandis, L. R. Tucker, M. Wagman, N. A. Wiggins, R. Wyer

Associate Professors: D. Bernstein, J. Campione, G. L. Clore, Jr., L. B. Cohen, G. B. Graen, G. Z. Greenberg, W. T. Greenough, A. K. Jonietz, R. P. Larsen, R. Linn, J. W. Loeb, J. Rappaport, E. Satinoff, K. G. Scott, E. Seidman, D. T. Shannon, W. M. Steinman, C. Trahiotis, R. Williges

Assistant Professors: L. C. Ate, G. Baxley, W. Brewer, B. J. Calder, J. L. Cohen, M. Coles, C. Dweck, A. Folsom, S. L. Golding, H. M. Halff, R. Henderson, J. Herman, L. E. Jones, W. B. Lawson, C. Lewis, E. Markman, T. Moore, W. Redd, G. R. Salancik, P. Shaw, K. W. Scholz

Graduate Programs. The Department of Psychology offers graduate work leading to the degrees of Master of Arts, Master of Science, Doctor of Philosophy, and Doctor of Psychology.

Doctor of Philosophy programs are offered in the following areas of psychology: biological, child development, clinical and counseling, cognitive, engineering, industrial, learning, personality, quantitative, sensation-perception, and social. The Master of Arts degree is awarded to students in the above programs as an intermediate degree or as a terminal degree in engineering psychology. Master of Science programs are offered in personnel psychology and in quantitative psychology. The Doctor of Psychology degree is restricted to clinical psychology.

Admission and Aid. The candidate for admission to a Master of Arts or Doctor of Philosophy program should ordinarily have the following preparation: a minimum of fifteen hours in psychology, a laboratory course in experimental psychology and a course in statistics, a one-year course in another laboratory science, an admission average of at least 4.0, and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have had some research experience.

The candidate for admission to a Master of Science program must ordinarily have completed an undergraduate major in the applied psychology curriculum at the University of Illinois. Students with an average of 3.5 may apply.

Admission to the Doctor of Psychology program is based on a combination of criteria including adequacy of preparation in the behavioral sciences, excellence of undergraduate academic performance, scores on the Graduate Record Examination, and a history of involvement and successful performance in professionally relevant activities.

It is not possible to accept all applicants who meet the minimal requirements for any of the above programs because admissions to graduate study in psychology are limited in number.

A wide variety of assistantships, traineeships, and fellowships is available for students in the Ph.D. programs.

Master of Arts and Doctor of Philosophy. The Master of Arts is awarded to candidates who complete satisfactorily eight units of work, including an acceptable thesis. The Doctor of Philosophy is awarded to candidates who go on to complete an approved program in their area of specialization and meet Graduate College requirements for the degree.

Master of Science. The Master of Science is awarded to candidates who complete satisfactorily eight units of work after completing an applied psychology undergraduate major at the University of Illinois.

Doctor of Psychology. The Doctor of Psychology is awarded in clinical psychology when the following requirements have been completed: three years of full-time course work consisting of twenty-four to twenty-eight units, of which twenty units must be at the 400 level, practicum training, or a minimum of five different clinical areas,

a preliminary examination administered by a committee appointed by the dean of the Graduate College, one year of internship following the third year of course work, a report on an approved topic relevant to clinical practice (not a dissertation), and a final examination administered by a committee appointed by the dean of the Graduate College.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

RADIO AND TELEVISION

Head of the Department: P. E. Welch
Correspondence and Information: Department of Radio and Television, University of Illinois at Urbana-Champaign, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professor: P. E. Welch
Assistant Professors: J. E. Cramer, E. F. Douglass

Graduate Program. The Department of Radio and Television offers graduate work leading to the Master of Science in Radio and Television. For the program leading to the Doctor of Philosophy in Communications, see page 60.

Admission and Aid. An admission average of at least 4.0 is required, but applicants with averages below 4.0 but above 3.5 may be considered in individual cases. All applications, whether simply for admission or for admission and financial aid, must be supported by a personal statement of commitment to the goals of graduate education and to telecommunications as a profession, three letters of recommendation from persons qualified to judge the applicant's ability to carry on advanced study and research and their capacity to pursue a successful career in this field, and, if applicable, evidence of professional experience within the telecommunications industry. This supportive material should be sent directly to the Department of Radio and Television. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees. Positions outside the department calling for broadcasting skills may be available to qualified applicants.

Master of Science. Requirements for the degree of Master of Science in Radio and Television include the following: a minimum of eight units consisting of a major of at least four units including the Seminar in Radio and Television, a minor of at least two units, normally in an area outside the College of Communications, a one-unit thesis or approved project, a minimum of four units in courses (including thesis or approved project) at the 400 level, at least three of which must be in the major field.

RECREATION AND PARK ADMINISTRATION

Acting Head of the Department and Coordinator of Curriculum and Instruction: Joseph J. Bannon
Correspondence and Information: Joseph J. Bannon, Acting Head, Department of Recreation and Park Administration, University of Illinois at Urbana-Champaign, 104 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professor: A. V. Sapora
Associate Professors: J. J. Bannon, H. E. Weaver
Assistant Professors: A. F. Gramza, S. L. Gunn, G. A. Lowrey, Jr., R. Martens, C. W. Pezolt, M. G. Wade, S. Weidemann

Graduate Programs. The Department of Recreation and Park Administration offers programs of study leading to the Master of Science in Recreation and the Doctor of Philosophy in Physical Education with specialization in Recreation. The Master of Science program may either prepare supervisors and administrators for public parks and recreation systems, treatment centers for the ill and handicapped, and various private and semipublic settings providing leisure services, or be the first step toward the Ph.D. program. The Ph.D. program is, in general, designed to train teacher-scholars and research personnel in the study of leisure behavior or the management of leisure service delivery systems or both.

Admission and Aid. The departmental Graduate Selection Committee strives to select those students with maturity and experience who show real promise of being academically and professionally productive. The previous degree field is of importance and preference is given to those with a solid array of undergraduate courses in recreation or a master's degree in the field. Preference is also given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students as fellowships, teaching or research assistantships, and tuition and fee waivers.

Individuals who wish to be considered for the M.S. program must present an admission average of at least 3.5, thirty semester hours of approved undergraduate credit in recreation or closely allied fields, fifteen semester hours in the social and psychological sciences, eight semester hours in the natural sciences, a course in statistics or tests and measurements, and successful field experience or credit field work. Students whose undergraduate training is deficient in one or more areas may be admitted with deficiencies to be removed during the first year of graduate study.

Students in the department seeking admission to the Ph.D. program must apply formally and will be considered in competition with applicants who are taking the master's degree elsewhere. They must have an admission average of 4.0 for the last sixty hours of undergraduate work and previous graduate study, satisfactory scores on both the Miller Analogies Test and the Graduate Record Examination, and successful experience in the field. Candidates are required to have a personal interview with the head of the department or a representative.

Master of Science. A candidate for the M.S. in Recreation and Park Administration must spend at least two semesters in residence, and complete at least eight units, three of which must be in the 400 series. Four of these units should be in the area of specialization. A thesis may be written for two units. Those waiving the thesis are required to take and pass a final comprehensive written examination. A full-time student may complete this program in one calendar year.

Doctor of Philosophy. A candidate for the Ph.D. must spend at least two years in residence and satisfactorily complete sixteen units beyond the master's degree. These units include the Ph.D. dissertation. Two languages are required but may be waived provided two additional units of course work are substituted for each language. Graduate examinations include written preliminary examinations taken at the completion of formal course work, oral preliminary examinations on proposed research of the thesis, and a final examination in defense of the doctoral thesis.

ROMANCE LINGUISTICS

Graduate Programs. A concentration in romance linguistics is available to candidates for the Doctor of Philosophy in French, in Linguistics, or in Spanish. The curriculum is based upon appropriate course offerings in the three departments; further information may be obtained from the heads of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: R. T. Fisher, Jr.
Correspondence and Information: Director of the Russian and East European Center, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: P. P. Bernard, W. C. Blaylock, C. L. Dawson, E. J. DeMaris, F. Dovring, J. D. Fellmann, R. T. Fisher, Jr., J. Gorecki, F. M. Gottheil, K. A. Hitchins, D. R. Hodgman, K. A. Klein, E. G. Lewis, P. B. Maggs, J. R. Millar, L. H. Miller, J. A. Nichols, T. Pachmuss, P. W. Schroeder, D. B. Shimkin
Associate Professors: E. C. Bristol, R. Dunatov, F. Y. Gladney, S. P. Hill, J. P. McKay, D. L. Ransel, D. M. Shtohryn, B. P. Uroff
Assistant Professors: K. N. Brostrom, E. F. Cohen, H. H. Hock, M. J. Kenstowicz, E. F. McClure, M. M. Shorish

Graduate Programs. Graduate programs in Russian Language and Area Studies are offered by the Russian and East European Center in cooperation with various departments. The three programs listed below are designed to accompany work in a standard discipline such as anthropology or economics. Accordingly, it is the department of the student's primary discipline which receives and acts on the application for admission.

Minor for the Master's Degree. A candidate for the master's degree who elects Russian Language and Area Studies as a minor must earn at least two units of graduate credit in courses devoted to Russia and chosen from the fields of anthropology, economics, geography, history, law, library science, literature, political science, and sociology.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects Russian Language and Area Studies as a minor must demonstrate a reading command of Russian as tested by examination or by completion of Russian 104 or 401 with a grade of A or B, and in addition, must earn at least four units of graduate credit in the group of relevant courses defined above. The four units must include courses from at least two departments outside of, and may at the same time include up to one unit from within, the department offering the candidate's major.

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is awarded by the Graduate College and the Russian and East European Center. It is for persons with the baccalaureate who are enrolled in advanced studies in any discipline and who wish at the same time to gain a knowledge of the Russian language and area. The requirements are as follows: (1) A good command of written and spoken Russian, as determined by special examinations. (2) At least six graduate units relating to Russia, distributed among at least three of the departments represented in the program (anthropology, economics, geography, history, law, library science, political science, Russian, and sociology) other than the student's own major department. If the student's major department is one of

the aforementioned nine, up to one unit from the major department may be counted as part of this requirement. (3) A special essay based largely on Russian sources which must meet, at the minimum, the standard normally required in a master's thesis. A copy of the student's master's thesis or doctoral dissertation may be submitted in fulfillment of this requirement.

SLAVIC LANGUAGES AND LITERATURES

(Including Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Slavic, and Ukrainian)

Head of the Department: C. L. Dawson
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois at Urbana-Champaign, 3092 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: C. L. Dawson, K. Klein, T. Pachmuss
Associate Professors: E. Bristol, R. Dunatov, F. Y. Gladney, S. P. Hill
Assistant Professors: K. Brostrom, E. Cohen, M. Kenstowicz

Graduate Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the Master of Arts in Russian, Master of Arts in the Teaching of Russian, and Doctor of Philosophy in Russian literature or Slavic linguistics.

Admission and Aid. Applicants should have an average of 4.0 or above in their last two years of undergraduate course work. Students with a grade-point average between 3.75 and 4.0 may be admitted with special approval of the department.

Students electing Russian as a major subject should have had the equivalent of at least four years of Russian in college, including practical work in the use of the language and some advanced course work in Russian literature.

Students choosing Russian as a minor subject should consult the department.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts in Russian. In addition to fulfilling the general requirements of the Graduate College, candidates must pass both a written and an oral examination. Students may major in literature or linguistics. Students majoring in literature must present at least two courses in linguistics; those majoring in linguistics must present at least two courses in literature.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take: (1) Russian, five units, including at least two units from courses open only to graduates. (2) Education, two units, including one unit in educational psychology and one unit in history and philosophy of education. (3) Electives, one unit. These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 28, requirements for teacher certification.

Doctor of Philosophy. All candidates for the Ph.D. must fulfill the general requirements of the Graduate College and must have a reading knowledge of French and German. A student may choose literature or linguistics as a major field. The student must also present a minor consisting of three graduate-level courses in a single field or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature,

or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another Slavic language or literature in the original or both. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other Slavic languages or literatures in the original or both.

Graduate courses are offered in the following Slavic languages: Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, and Ukrainian.

SOCIAL SCIENCES

Correspondence and Information: Harry M. Johnson, Director of the Program, Master of Arts in the Social Sciences, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, Urbana, Illinois 61801

Master of Arts in the Social Sciences. A special program leading to the Master of Arts in the Social Sciences is offered to students through the Division of Social Sciences (including anthropology, economics, geography, history, philosophy, political science, psychology, social work, and sociology). This program is designed to meet the needs of students who plan to teach the social sciences and the needs of those who wish to study in several related fields within the social sciences rather than to specialize in one department. To qualify for this program a student must have an admission average of at least 4.0. Applications of students with averages below 4.0 but above 3.75 are considered and admitted in some cases.

The Master of Arts in the Social Sciences requires a major of four units and a minor or double minor totaling four units. No minor may be less than two units. At least three of the eight units required for this degree must be in 400-level courses, with at least two of these three units in the major. The student's work is directly supervised by an advisory committee composed of two or three members, one for each field of study forming a major or minor. The representative of the major field is the chairman of the committee. As part of the work in the major field, each student is required to write an essay under the direction and subject to the approval of the chairman of the committee. Work upon this essay may constitute, through registration in research courses, part of the four units of work required for the major. Upon completion of studies the student must pass an oral comprehensive examination given by the committee as a whole.

Correspondence and Information: J. R. Dahl, Director of the Program, Master of Arts in the Teaching of Social Studies, University of Illinois at Urbana-Champaign, 300c Gregory Hall, Urbana, Illinois 61801

Master of Arts in the Teaching of Social Studies. Candidates for this degree should hold secondary school social studies certificates. Eight units of graduate work are required. Four units are to be in the social studies (two of these must be in history); three units are in educational psychology, history and philosophy of education, and secondary and continuing education; and one unit is an elective chosen in consultation with the adviser.

The required admission average is 3.75. Applications of students with averages below 3.75 but above 3.5 are considered and admitted in special cases.

SOCIAL WORK

Director of the Jane Addams School of Social Work: MARK P. HALE
Associate Directors: CHARLES H. HENDERSON, MERLIN TABER
Correspondence and Information: Director, Jane Addams School of Social Work, University of Illinois at Urbana-Champaign, 1207 West Oregon Street, Urbana, Illinois 61801

FACULTY

Professors: D. BRIELAND, L. B. COSTIN, M. P. HALE, F. H. ITZIN, M. TABER
Associate Professors: R. J. ANDERSON, C. H. HENDERSON, P. L. LEUENBERGER, M. MONKMAN, A. J. VATTANO, S. H. WATTENBERG, R. WEAGANT
Assistant Professors: N. ASHER, C. R. ATHERTON, R. A. DOWNING, G. L. EUSTER, K. GOULD, E. N. GULLERUD, E. HANDLER, B-L. KIM, I. VARGUS

Graduate Programs. The Jane Addams School of Social Work offers programs leading to the Master of Social Work and the Doctor of Social Work. Similar programs are offered on both the Chicago Circle campus and the Urbana-Champaign campus of the University. Social work career concentrations are provided in: social and direct treatment which include casework and group work; community organization and planning; and social policy and administration. The M.S.W. curriculum may be completed in sixteen months of continuous full-time study on the Urbana-Champaign campus. The D.S.W. curriculum requires two years of study beyond the master's degree. Field instruction is conducted through social agencies located in Urbana-Champaign, Decatur, Danville, Peoria, and Springfield, and by special arrangements in selected other communities. A 4.0 is required of all students to receive the M.S.W. degree.

Admission and Aid. Each applicant will be considered on an individual basis. The applicant must meet the following minimum requirements for consideration: a minimum of twenty hours in social sciences courses; a course in statistics; an admission average of not less than 3.75. A committee of the faculty will give special consideration to those with a grade-point average below 3.75 but above 3.5 if they possess significant experience in social work or have a good background in the social sciences. Because applications for admissions usually have far exceeded capacity in recent years, the grade-point averages of students admitted have been well above the minimum. The student must show evidence of physical capacity to complete a study program which taxes physical energy, emotional maturity, interest in and liking for people, an ability to establish effective and healthful relationships, and personal integrity as demonstrated by intellectual honesty and a sense of responsibility. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees. Some social agency stipends are also available.

SOCIOLOGY

Head of the Department: BERNARD KARSH
Assistant to the Head and Graduate Information Officer: ELIZABETH YANKWICH
Correspondence and Information: Department of Sociology, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: D. J. BORDUA, N. K. DENZIN, F. C. FLIEGEL, W. H. FORM, J. GORECKI, N. JACOBS, H. M. JOHNSON, B. KARSH, G. LUESCHEN, R. J. SIMON, S. SUDMAN
Associate Professors: H. M. CHOLDIN, J. HUBER, S. J. KRONUS, K. LAND, J. W. ROBINSON, M. SOLAUN, J. L. SPAETH, J. C. VAN ES, N. F. WILEY

Assistant Professors: H. S. Bennett, M. Felson, R. A. Jones, J. R. Kimberly, C. L. Kronus, W. E. Maxwell, S. C. McPhail, Jr., J. F. O'Connor, K. E. Southwood, C. Uche, P. D. Wiebe
Visiting Assistant Professor: R. D. Vanneman

Graduate Programs. The Department of Sociology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. The Master of Arts program is, in general, designed as a first step toward the doctorate. Considerable specialization is possible in the Ph.D. program, with a general emphasis on preparation for a career in research and teaching at the college and university level.

Admission and Aid. Students applying for admission should have a strong undergraduate background in one of the social sciences, preferably sociology. Prior training in logic, philosophy of science, mathematics, and statistics is given special attention in considering applicants. Applicants must submit Graduate Record Examination scores on the tests of verbal ability and quantitative ability and on the advanced test in sociology. An admission average of 4.0 is required, although otherwise exceptional students are occasionally admitted with somewhat lower average grades. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts. A candidate for the A.M. in sociology must earn ten units of graduate credit, including one advanced course in research methods and one advanced course in statistics.

Doctor of Philosophy. Candidates for the Ph.D. must satisfactorily complete two advanced courses in statistics and at least one advanced course in research methods. Comprehensive examinations, either written or oral, are required in sociological theory, research methods, the student's area of specialization, and in three supplementary substantive areas. Information on additional requirements is given in the departmental manual for graduate students.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan and Rumanian)

Head of the Department: A. M. Pasquariello
Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois at Urbana-Champaign, 4080 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. H. D. Allen, S. W. Baldwin, Jr., W. C. Blaylock, J. S. Flores, M. H. Forster, L. Leal, R. E. Lott, A. M. Pasquariello, A. R. Pietrangeli, A. Porqueras-Mayo
Associate Professors: A. Aiex, H. W. Cowes, D. R. Hershberg, T. C. Meehan, R. A. Preto-Rodas, M. D. Saltarelli
Assistant Professors: A. O. Avellaneda, M. M. Azevedo, A. Cassell, M. Francescato, D. Wanner

Graduate Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy in Spanish, in Italian, or in Portuguese, and to a Master of Arts in the Teaching of Spanish. Fields of

concentration are Spanish linguistics, romance linguistics, Spanish literature, Latin American literature, Italian literature, and Portuguese literature. Graduate courses in Catalan and Rumanian are available.

Admission and Aid. An admission average of 4.0 is required, although otherwise exceptional students are occasionally admitted with a somewhat lower average. Prerequisite for a graduate major is an undergraduate major in one romance language or Latin, or consent of the department. Applicants living in the United States who intend to major in Spanish must submit Graduate Record Examination scores on the verbal and quantitative tests and on the advanced test in Spanish. Students doing graduate work for any advanced degree in Spanish must possess or acquire a practical command of the language. For the Doctor of Philosophy, some knowledge of Italian or Portuguese is required. Parallel training in one or more other languages or literatures, such as English, French, German, Greek, Italian, Latin, and Portuguese is desirable.

The programs in Spanish are described below. Individual programs will be developed for students who wish to major in Italian or Portuguese. For additional information consult the department.

Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and on a general reading list. Three areas of specialization are offered: Spanish or Spanish-American literature, Spanish linguistics, and the teaching of Spanish. Detailed statements of the course requirements for each specialization may be obtained from the department.

Doctor of Philosophy. Students working toward the Doctor of Philosophy are admitted with provisional departmental status until their performance in graduate work is judged acceptable for full departmental status by the department's graduate committee. A comprehensive written examination is used as a basis for this judgment. Candidates are required to present evidence of a reading knowledge of French and of one other language to be selected in consultation with the adviser, and candidates in Spanish are expected to take at least two units in seminar courses.

Five areas of specialization are available: Renaissance and golden age, Spanish literature of the nineteenth and twentieth centuries, Latin American literature, Spanish linguistics, and romance linguistics. For the specialization in Spanish linguistics, general linguistics is a required minor; the department should be consulted on the selection of minors for the other specializations.

SPEECH AND HEARING SCIENCE

Head of the Department: John J. O'Neill

Correspondence and Information: John J. O'Neill, Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, 601 East John Street, Champaign, Illinois 61820

FACULTY

Professors: A. J. Derbyshire, C. W. Kim, J. J. O'Neill, S. P. Quigley, E. W. Stark, W. R. Zemlin

Associate Professors: N. W. Hunter, F. L. Johnson, M. E. Joseph, J. L. Locke, E. P. Paden, L. J. Sanders, R. K. Simpson

Assistant Professors: P. B. Arlt, D. L. Bode, W. DeMarco, J. G. Erickson, R. G. Johnston, F. L. Nasca, M. A. O'Neill, S. J. Peterson

Graduate Programs. The department offers courses leading to the Master of Arts, Master of Science, and Doctor of Philosophy in Speech and Hearing Science, and the Master of Science in the Education of the Deaf.

Admission and Aid. Admission to the program in education of the deaf requires the completion of a baccalaureate or an equivalent degree comparable to that granted by the University of Illinois. For all other areas: satisfactory completion of a four-year curriculum preparatory to speech and hearing science, speech pathology or audiology, or sixteen hours of undergraduate credit in the following areas or their equivalents: speech pathology, audiology, phonetics, and anatomy and physiology of the vocal mechanism, or speech science and/or voice science. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master's Degrees in Speech and Hearing Science. Two types of master's degrees are offered: the Master of Science and the Master of Arts. The incoming student in both of these programs takes an examination covering audiology, speech and hearing science, and speech pathology. The examination serves two purposes: to assess the student's general knowledge of the basic aspects of these areas (qualifying), and to evaluate specific strengths and weaknesses in the student's major area of study (evaluative). The results of these examinations are used to help students plan their graduate programs. As a part of the requirements for either degree the student must pass the qualifying examination in his nonmajor areas sometime during his course of study.

Master of Science. The program leading to the degree of Master of Science is usually considered to be a terminal program for the purpose of training competent clinicians who intend to seek employment in the school environment. It is designed to provide comprehensive knowledge of the various types of speech, hearing, and language disorders, their causes, and the principles of diagnostic and therapeutic management. This program requires four units from a group of courses appropriate to the areas of speech pathology, audiology, or language; two units from selected courses in education; and two units of electives.

Master of Arts. The Master of Arts may be taken as either a terminal degree or as preparation for further graduate study with concentration in audiology, language, speech and hearing science, or speech pathology. It is recommended for those students who plan to continue their education in a doctoral program as well as for those students who plan to terminate their formal education with the Master of Arts. As a terminal degree it is designed to insure clinical competence. As a nonterminal degree it permits the student to take the basic professional courses which then become an integral part of the student's entire graduate program. Students may take all eight units within the four specialized areas or may elect a minor outside the department. The only course which is required of all candidates is Speech 399 (Design and Analysis of Experiments in Speech and Hearing Science). A thesis can be a part of the A.M. program depending upon the candidate's educational and professional goals.

Doctor of Philosophy. The doctoral program provides intensive training in speech and hearing processes and disorders. The program may be planned with specialization in any one of the four areas: audiology, language, speech and hearing science, and speech pathology. The minimum academic requirement for this degree is sixteen units. If there are deficiencies in the student's background, additional courses will be required and courses taken for this purpose are usually not counted toward the minimum requirement. In addition, if the candidate did not write a thesis as part of his master's program, he will be required to demonstrate his research competence during his initial semester of study. Individual study programs tailored to the special needs of the student are planned by the student and his adviser. The only courses which are required are Speech 475 (Experimental Phonetics, I) and Speech 476 (Experimental Phonetics, II).

Master of Science in Education of the Deaf. The program is focused on preparing elementary-level teachers of the hearing impaired. A minimum of eight units of course work, at least three of which are to be at the 400 level. History and Philosophy of Education 304 and 305 and Educational Psychology 311 and 312 are required.

SPEECH COMMUNICATION

Head of the Department: Roger Nebergall
Director of Graduate Study: Kenneth Andersen
Correspondence and Information: Director of Graduate Study, Department of Speech Communication, University of Illinois at Urbana-Champaign, 247 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: D. E. Andersen, J. J. Bateman, C. M. Behringer, K. W. Broadrick, B. W. Hewitt, H. L. Mueller, R. E. Nebergall, M. H. Nichols, G. H. Shattuck
Associate Professors: J. C. Ahart, R. A. Clark, J. G. Delia, R. L. Ince, B. R. Works
Assistant Profesors: D. L. Bode, P. Franklin-White, F. P. Hilpert, L. Hudson, D. Llewellyn, S. M. Mahood, J. F. Pazereskis, D. L. Swanson, S. H. Thomas, R. E. Tymchyshyn, J. W. Wenzel

Graduate Programs. The Department of Speech Communication offers courses leading to the Master of Arts and Doctor of Philosophy.

Admission and Aid. The Graduate Record Examinations, verbal and quantitative, and an admission average of at least 4.0 are required in all curricula. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees.

Master of Arts. For the degree of Master of Arts, students may concentrate in rhetorical and communication theory or interpretation. They may also select a special curriculum in the teaching of speech. The entering student should present the equivalent of sixteen hours of undergraduate work in speech, communications, or interpretation. In addition to meeting general regulations of the Graduate College, a final written examination is required of all candidates. In some cases an oral examination is also stipulated. A thesis is optional. Students wishing to concentrate in theatre should apply to the Department of Theatre.

Master of Arts in Teaching. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College requirements and department requirements including the comprehensive examination, M.A.T. candidates must complete six units of work in the department plus the units of required work in education. See page 28.

Doctor of Philosophy. For the Doctor of Philosophy, students may exercise one of three options: rhetoric and communication theory, theatre, and interpretation. Students are accepted as candidates for the doctor's degree who present either a well-rounded undergraduate education with at least sixteen hours of credit in speech or who hold a master's degree in speech or theatre from an accredited institution.

THEATRE

Chairman of the Department: Barnard Hewitt
Correspondence and Information: Chairman of the Department of Theatre, University of Illinois at Urbana-Champaign, 4-122 Krannert Center for the Performing Arts, Urbana, Illinois 61801

FACULTY

Professors: C. M. Behringer, B. Hewitt, C. H. Shattuck, B. R. Works
Associate Professor: J. C. Ahart
Assistant Professors: R. Auletta, S. Benson, P. J. Brady, P. Franklin-White, M. C. Hardy, D. Koertge, D. Llewellyn, S. Murray, R. Tymchyshyn

Graduate Programs. The Department of Theatre offers graduate work leading to the Master of Arts in Theatre and, in cooperation with the Department of Speech, the Doctor of Philosophy in Speech with a theatre option.

Admision and Aid. Applicants will be considered who have an admission average of at least 3.5 and either an undergraduate major in theatre, which includes at least nine hours in dramatic literature as part of the major or in addition to the major, or any undergraduate major which includes at least nine hours of basic courses in theatre (acting, directing, production) and seven hours in speech or dramatic literature. Applicants will be considered for admission to the program leading to the degree of Doctor of Philosophy in Speech with a theatre option who have at least a 4.0 average in the last four semesters of graduate and undergraduate work, and a Master of Arts or a Master of Fine Arts in Theatre, or the equivalent. Teaching and production assistantships, fellowships, and waivers of tuition and fees are available in limited numbers.

Master of Arts. A candidate for the A.M. must spend at least two semesters or the equivalent in residence. The student must complete at least eight units of course work in theatre and related studies, including at least two units in history and theory of theatre and two in applied theatre, and must pass a final comprehensive examination. A full-time student can complete this program in one academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's must apply formally and will be considered in competition with applicants who present a master's from elsewhere. Requirements for the degree are a minimum of eight units in courses in theatre and related studies beyond the master's, a reading knowledge of two foreign languages, or of one foreign language and one of the prescribed substitutes, and a minimum of eight units of dissertation research. When the course and language requirements are fulfilled, the student must pass a comprehensive oral and written examination and defend a dissertation orally before a committee of the graduate faculty. The program ordinarily requires two or three years beyond the master's.

THEORETICAL AND APPLIED MECHANICS

Head of the Department: Richard T. Shield
Graduate Program Coordinator: Robert E. Miller
Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 212 Talbot Laboratory, Urbana, Illinois 61801

FACULTY

Professors: A. P. Boresi, C. E. Bowman, D. E. Carlson, M. E. Clark, H. T. Corten, G. A. Costello, T. J. Dolan, R. A. Eubanks, C. E. Kesler, H. L. Langhaar, T. J. Lardner, R. E. Miller, J. Morrow, J. M. Robertson, R. T. Shield, O. M. Sidebottom, G. M. Sinclair, M. C. Stippes, C. E. Taylor, H. R. Wetenkamp, W. J. Worley
Associate Professor: T. M. Elsesser
Assistant Professors: R. J. Adrian, N. E. Asbaugh, F. G. Bauling, J. W. Phillips, J. S. Walker

Graduate Programs. The Department of Theoretical and Applied Mechanics offers a full course of study leading to the Master of Science and Doctor of Philosophy degrees. Students may specialize in such areas as elasticity, plasticity, elastic stability, wave propagation, dynamics and vibrations, photoelasticity, fatigue of metals, crack propagation, ideal or viscous fluid flow, magnetohydrodynamics, biomechanics, and shell theory. A major in applied mathematics is also available (see page 99).

Admission and Aid. Students admitted for graduate work in Theoretical and Applied Mechanics usually have a bachelor's or master's degree in engineering. However, students with majors in mathematics, physics, computer science, and similar areas may also be admitted. Admission with full standing requires a 4.0 admission average. Applicants with averages below 4.0 but above 3.5 are considered for admission on a probationary basis. Financial aid is available to selected students in the form of research assistantships, teaching assistantships, fellowships, and waivers of tuition and fees.

Master of Science. Candidates are required to complete a minimum of eight units of graduate work including a thesis (ordinarily two units) and to maintain a minimum grade-point average of 4.0. If a student does not wish to present a thesis, then nine units of course work are required. A full-time student can complete this program in one academic year of study. A student who has an assistantship normally completes the requirements in one calendar year.

Doctor of Philosophy. Candidates for the Doctor of Philosophy are required to complete eight units of course work beyond the master's degree with a minimum grade-point average of 4.0, including at least one-half unit from each of the following major areas in the department: applied mathematics, dynamics and vibrations, fluid mechanics materials engineering, and solid mechanics. A student must pass a written qualifying examination and an oral preliminary examination before commencing his dissertation. The thesis research normally comprises about half the work beyond the master's degree. A student can complete this program in two years' study beyond the master's degree.

URBAN AND REGIONAL PLANNING

Head of Department: Michael P. Brooks
Correspondence and Information: Head of the Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign, 909 West Nevada Street, Urbana, Illinois 61801

FACULTY

Professors: L. F. Blair, M. P. Brooks, C. W. Forrest, E. C. Freund, W. I. Goodman, A. Z. Guttenberg, S. Keyes, L. B. Wetmore
Associate Professors: A. G. Onibokun, J. A. Quinn
Assistant Professors: L. F. Heumann, C. V. Patton
Lecturer: A. M. Isserman

Graduate Program. The Department of Urban and Regional Planning offers graduate work leading to the degree of Master of Urban Planning.

Admission and Aid. To be admitted, students must have an admission average of at least 3.75. While the social sciences, the design professions, civil engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities, the physical sciences, and other fields. Financial aid is available to a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Urban Planning. The master's degree program is designed to prepare students for careers in planning. Such careers can involve service in public agencies at any of the several levels of government, in private consulting practice, or in other organizations in need of planning services. Alternatively, the program may prepare students for advanced work leading to the Ph.D. degree and a career in teaching or research or both. The program combines a set of minimum requirements with a high degree of flexibility and choice. The course of study ordinarily requires two years. First-year students typically follow a core program focusing on the basic elements of planning, including studies in planning theory, analytical methods, planning procedure, and administration. The second year provides opportunities for further work in areas of specialized interest. To qualify for the degree, a student must complete a minimum of thirteen and one-half units, of which at least eight must be in urban and regional planning courses. At least three must be at the 400 level, and two of these must be in urban and regional planning.

VETERINARY MEDICAL SCIENCE

Head of the Department: L. Meyer Jones
Assistant Head: Kenneth W. Sloan
Correspondence and Information: Assistant Head, Department of Veterinary Medical Science, University of Illinois at Urbana-Champaign, 141 Veterinary Medicine Building, Urbana, Illinois 61801

FACULTY

Professors: P. D. Beamer, H. S. Bryan, A. J. Cawley, P. R. Fitzgerald, L. E. Hanson, H. J. Hardenbrook, R. D. Hatch, L. C. Helper, L. M. Jones, N. D. Levine, D. R. Lingard, R. P. Link, J. E. Lovell, R. C. Meyer, W. L. Myers, M. Ristic, L. E. St. Clair, A. H. Safanie, A. G. Schiller, D. Segre, J. Simon, E. Small, A. R. Twardock, A. M. Watrach, G. T. Woods
Associate Professors: J. D. Conroy, D. H. Ferris, G. L. Jackson, A. H. Killinger, J. P. Manning, W. M. Newton, H. A. Reynolds, H. E. Rhoades, F. E. Romack, J. C. Thurmon, K. S. Todd, W. A. F. Tompkins
Assistant Professor: D. K. Normandin

Graduate Programs. The Department of Veterinary Medical Science offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Fields of specialized study in the department include the following: anatomy; clinical sciences; immunology; microbiology; parasitology; pathology; pharmacology; and physiology. Degree requirements are described in a brochure available from the department.

Admission and Aid. Applicants must have an average of 4.0 to be admitted with full standing. Those with an average between 3.75 and 4.0 may be admitted on limited status. The undergraduate program should include at least five semester hours of physics or mathematics, fourteen hours of chemistry, and fifteen hours of biological sciences. A student who is deficient in these subjects may be accepted but will be required to remove the deficiency during the first year of residence. Qualifications of students must be approved by the department's Committee on Admission of Graduate Students.

A limited number of teaching and research assistantships in the departments of the College of Veterinary Medicine are available.

Where to Write

ADMISSION

Graduate and Foreign Admissions
University of Illinois at Urbana-Champaign
312 Metallurgy and Mining Building
Urbana, Illinois 61801
or
The Graduate College
University of Illinois at Urbana-Champaign
330 Administration Building
Urbana, Illinois 61801

CHICAGO CIRCLE

The Graduate College
P.O. 4348
Chicago, Illinois 60680

EMPLOYMENT (Hourly)

Director, Student Employment
University of Illinois at Urbana-Champaign
420 Student Services Building
Champaign, Illinois 61820

EXTRAMURAL CLASSES

Office of Continuing Education and Public Service
University of Illinois at Urbana-Champaign
118 Illini Hall
Champaign, Illinois 61820

FELLOWSHIPS, ASSISTANTSHIPS, OTHER FINANCIAL AID

The prospective department

FOREIGN STUDENTS (Passport, Visa Assistance)

Director, Office of Foreign Student Affairs
University of Illinois at Urbana-Champaign
310 Student Services Building
Champaign, Illinois 61820

HOUSING

Director, Housing Division
University of Illinois at Urbana-Champaign
420 Student Services Building,
Champaign, Illinois 61820

MEDICAL CENTER (Medical and Dental Sciences, Nursing, Pharmacy)

The Graduate College
P.O. Box 6998
Chicago, Illinois 60680

MOTOR VEHICLE AND BICYCLE REGISTRATION

Motor Vehicle Registration Office
University of Illinois at Urbana-Champaign
507 East Daniel Street
Champaign, Illinois 61820

SERVICES FOR PERMANENTLY PHYSICALLY HANDICAPPED STUDENTS

Division of Rehabilitation-Education Services
University of Illinois at Urbana-Champaign
Rehabilitation-Education Center
Champaign, Illinois 61820

VETERANS

Veterans Educational Benefits
University of Illinois at Urbana-Champaign
130 Student Services Building
Champaign, Illinois 61820

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1976-78

Graduate Programs

University
of Illinois
at Urbana-
Champaign

The University of Illinois is in full compliance with all federal and state nondiscrimination and equal opportunity laws, orders, and regulations, and will not discriminate against any person because of race, color, sex, religion, or national origin in any of its educational programs and activities.

For additional information on the equal opportunity and affirmative action policies of the Urbana-Champaign campus, please contact the office of Walter Strong, Assistant Vice-Chancellor for Academic Affairs and Affirmative Action.

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1976-78
Graduate Programs

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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FOREWORD

The University of Illinois was founded in 1867 as the land grant institution of the State of Illinois. Its main campus is located 130 miles south of Chicago in the twin cities of Urbana and Champaign, a community of 100,000 people.

From modest beginnings as the Illinois Industrial College, the Urbana-Champaign campus of the University of Illinois has grown to a community of 35,000 students of whom 8,500 are enrolled in the Graduate College. A large and distinguished graduate faculty, outstanding research facilities, one of the top-ranked libraries in the nation, as well as a large array of social and cultural events and activities, make the University of Illinois at Urbana-Champaign an especially stimulating environment for graduate study.

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ROGER G. CLARK, Ph.D., Assistant Dean
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UNIVERSITY CALENDAR — URBANA-CHAMPAIGN CAMPUS

A Graduate College calendar giving important dates and deadlines for graduate students enrolled on campus may be obtained in 330 Administration Building.

Eight-Week Summer Session, 1976

June 7, Mon.-June 8, Tues.	Registration
June 9, Wed.	Instruction begins
July 5, Mon.	Independence Day (all-campus holiday)
July 6, Tues.	Beginning of second four-week courses
July 29, Thurs.	Last day of instruction
July 30, Fri.-July 31, Sat.	Summer session examinations

First Semester, 1976-1977

Aug. 22, Sun.-Aug. 27, Fri.	New Student Week
Aug. 25, Wed.-Aug. 27, Fri.	Registration
Aug. 30, Mon.	Instruction begins
Sept. 6, Mon.	Labor Day (all-campus holiday)
Nov. 11, Thurs.	Veterans Day observance (classes dismissed 10:45 to 11:15 a.m.)
Nov. 24, Wed. 5:00 p.m.-Nov. 29, Mon. 7:00 a.m.	Thanksgiving holiday
Dec. 14, Tues.	Last day of instruction
Dec. 15, Wed.	Reading day
Dec. 16, Thurs.-Dec. 23, Thurs.	Semester examinations
Dec. 24, Fri.	Christmas (all-campus holiday)
Dec. 30, Thurs.-Jan. 1, Sat.	New Year's holiday (all-campus holiday)

Second Semester, 1976-1977

Jan. 9, Sun.-Jan. 14, Fri.	New Student Week
Jan. 12, Wed.-Jan. 14, Fri.	Registration
Jan. 17, Mon.	Instruction begins
Mar. 12, Sat., 1:00 p.m.	Spring vacation begins
Mar. 21, Mon., 7:00 a.m.	Spring vacation ends
May 5, Thurs.	Last day of instruction
May 6, Fri.	Reading day
May 7, Sat.-May 14, Sat.	Semester examinations
May 15, Sun.	Commencement exercises

GRADUATE COLLEGE

The Graduate College is an administrative unit which has jurisdiction over all programs leading to advanced degrees. It is the responsibility of the Graduate College to develop and safeguard standards of graduate work and to promote and assist research by faculty members and graduate students in all fields. The responsibility for initiating, developing, and administering degree programs is delegated to the departments or other academic units (the Laboratory for Atmospheric Research is a recently established example). The Graduate College provides supporting services as well as general supervision to these degree-granting units. All postbaccalaureate students, except those in curricula leading to the degrees of Juris Doctor and Doctor of Veterinary Medicine, are enrolled in the Graduate College rather than in a disciplinary college (e.g., Engineering, Fine and Applied Arts, Liberal Arts and Sciences).

SOME OUTSTANDING UNIVERSITY RESOURCES AND FACILITIES

University Library

The University Library's resources for advanced study and research are exceptional. Its catalogued collections exceed five million volumes. Its uncatalogued collections include 532,000 pamphlets, 450,000 maps and aerial photographs, 950,000 music scores and parts, and 1,250,000 microtexts. In addition, the Library receives more than 80,000 periodicals, serials, and newspapers. This wealth of material is housed in the main library (3,800,000 volumes in the bookstacks) and thirty-four specialized libraries at convenient locations about the campus.

Outstanding collections have been developed in a number of areas. In the humanities: classical literature and archaeology; English literature of the sixteenth through the twentieth centuries; Romance and Slavic literature; German literature of the sixteenth and seventeenth centuries; American humor and folklore; and comparative philology. In the fine arts: architecture; landscape architecture; and music. In the social sciences: history of the western United States; Abraham Lincoln and the Civil War; Latin America of the revolutionary period; the Slavic countries; Ireland; and medieval and modern Europe; international law; labor and industrial relations; and political science. In the sciences and technology: agriculture; biological sciences (especially entomology, ornithology, and parasitology); chemistry; geology; mathematics; and physics.

The Rare Book Room houses a superior collection of more than 100,000 volumes, including over 1,000 incunabula. The collection has three major areas of strength: English history and literature, the history of geology, and the emblem book collection. The Milton collection is the finest in the world, including more than 400 different

editions of his works published during the seventeenth and eighteenth centuries. The oldest printed book is a 1455 copy of the Book of Genesis of the Gutenberg Bible; the most valuable is the Audubon Folio on permanent display. The catalogue of the collection has been published.

The completeness of the bibliographic and reference facilities make any sort of research possible. In addition, interlibrary loan service is provided for faculty and graduate student research.

Center for Advanced Computation

The Center for Advanced Computation conducts applied research, provides services to the academic community and state and federal governments, promotes interdisciplinary and applied research, and supports the development of computer technology needed for the solution of problems of importance to society. A principal activity of the center is the development of numerical techniques and software systems necessary for calculations in the social, life, and physical sciences.

The staff of the center consists of professionals, graduate research assistants, and academic personnel holding joint appointments in such academic departments as agricultural economics, business administration, computer science, the life sciences, psychology, and urban and regional planning. Research activities include numerical analysis, mathematical programming, information systems, economic modeling, land use/transportation planning, computer languages and operating systems, and graphics systems. Interdepartmental graduate research and educational activities are emerging from the research efforts, methodologies, and systems developed at the center.

The center has a large variety of computational resources, including access, via the Advanced Research Projects Agency (ARPA) Network, to the ILLIAC IV system. This highly reliable network links many of the country's major computer research laboratories and facilities through high-speed telephone lines. The center provides the education, documentation, consultation, and hardware and software necessary for the University of Illinois research faculty to use effectively the facilities of the center and the ARPA Network.

Center for Electron Microscopy

The Center for Electron Microscopy is not just an electron optics research laboratory; rather it is designed to serve the varied research needs of faculty and students and to provide an extensive training program. Its inventory of transmission electron microscopes includes routine performance instruments (RCA EMU 3C, 3E, and 3H) and

conventional high-resolution microscopes (Siemens Elmiskop 1, Hitachi HU-11 and 11C, and JEOL JEM-6A). For those requiring the highest resolving power, the center offers the JEOL JEM-100C, a state-of-the-art 100kV microscope with a lattice resolvancy of 1.4 Angstroms. The center provides two high quality scanning electron microscopes: the Kent-Cambridge Stereoscan, fully equipped with a nondispersive x-ray analyzer having multimode output; and the JEOL JSM-U3, one of the finest of the class utilizing a thermionic emitter. It will also soon be equipped with one of the most versatile electron microprobes available, the JEOL JXA-50A.

Ancillary equipment available to all users includes various ultramicrotomes, automatic knifebreakers, a pyramid cutter, several vacuum evaporators, a tissue drier, and a critical point drying device. For special techniques one ultramicrotome is equipped with a cryogenic sectioning kit; and one vacuum evaporator is equipped with an electron gun for vapor deposition of refractory materials and stages for freeze-etch and freeze-fracture work. Several completely equipped darkrooms and general specimen preparation facilities are also available.

The center's training program is the largest in the nation and is one of the few which offers full training in scanning electron microscopy. Graduate courses are offered in both transmission and scanning modes. Both the theoretical and practical aspects of electron microscopy are stressed so that students with no prior knowledge of electron microscope operation, specimen preparation, or photography are, after one semester's study, able to apply the tool to their research problems. An intensive training program is also offered during the summer for faculty and staff wishing to acquire the skills requisite to high quality transmission electron microscopy.

Computer-based Education Research Laboratory (CERL)

CERL has designed and operates PLATO IV, a flexible and sophisticated computer-based education system using a Control Data Corporation Cyber-73 computer as the central unit for approximately 1,000 student terminals which can be used independently and simultaneously. In addition to terminals at CERL, PLATO classrooms have been established at several locations on the Urbana-Champaign campus and the two Chicago campuses. Other PLATO terminals are located in educational institutions in the United States and Canada and in governmental and industrial locations. PLATO programs have been developed for all educational levels, kindergarten through graduate, as well as adult and continuing education programs.

Computing Services Office

Campuswide computing facilities for instruction and the research of both students and faculty are provided by the Computing Services Office. The central facility, located in the Digital Computer Laboratory, is an IBM System/360-75 with three million bytes of core storage. CSO provides consulting, keypunching services, and assistance in statistical applications for computer center users. Eight terminals located throughout the campus provide convenient job entry stations. One terminal, located in Commerce Building (West), also provides keypunching, consulting, and programming assistance, with special orientation to applications in the social sciences. Computer facilities are available to students and faculty in all disciplines on an around the clock basis.

Coordinated Science Laboratory

The Coordinated Science Laboratory is organized to provide an interdisciplinary research environment for faculty and students from the engineering sciences as well as other disciplines. Faculty members typically hold joint appointments in the Coordinated Science Laboratory where they conduct their own research and supervise that of graduate students, and in an academic department where they teach. Graduate students conducting thesis research in the laboratory earn their advanced degrees in the departments in which they are enrolled. Current areas of research activity include plasma physics, surface science, semiconductor devices, thin film devices, information theory and coding, systems theory, communication systems, switching theory and automatic fault diagnosis, artificial intelligence, high-density memories, plasma displays, man-machine interaction and retrieval, urban modeling development, optical information processing, and computational gas and fluid dynamics.

In addition to the usual supporting services, the laboratory maintains unique facilities for materials processing, including photochemical etching, electron beam welding, inert gas brazing, chemical plating, and glassblowing. Present computational facilities include a hybrid system consisting of a Control Data Corporation 1700 digital computer and an EAI-680 analog computer, and a Digital Equipment Corporation (DEC) System 10 which is used for time-sharing and real-time applications.

Institute for Child Behavior and Development (ICBD)

ICBD, housing in the College of Education, has a faculty of more than twenty members representing a variety of disciplines and professional areas including special education, psychology, speech and

hearing science, linguistics, ethology, sociology, social work, pediatrics, physical education, recreation, educational psychology, and early childhood education. This faculty, aided by more than 150 staff members and graduate students, engages in multidisciplinary research, training, and service on the full range of behavior and development of normal and exceptional children. Experimental day care and nursery school centers in the Institute's main building provide laboratories for the study of normal children. Special classes for very young children with various types of disabilities are operated in another of the Institute's facilities — the Colonel Wolfe School; and field stations for the study of exceptional children are maintained at several education and mental health facilities in Illinois and in other states.

Some of the long-term programs of research being conducted include studies of the development of memory, cognition, and language in normal infants and young children; the effects of psychotropic drugs on hyperactive and retarded children; memory and cognitive development of developmentally disabled children; the effects of anxiety on school performance; the effects of intensive early intervention on the development of very young disabled children; language and cognitive development of deaf children; and vocational training of deaf-blind and severely retarded children.

Institute for Environmental Studies

The Institute for Environmental Studies operates the Environmental Research Analytical Laboratory designed to meet the special needs in environmental research throughout the University. The laboratory is capable of working at the state-of-the-art detection limit and can handle and account for large numbers of samples on a routine basis with computer processing of analyses. It is equipped with a full spectrum of instruments for electrochemistry and for atomic absorption and emission spectroscopy. It also has facilities for gas and high-pressure liquid chromatography. Instrumentation has recently been added for energy-dispersive x-ray fluorescence and instrumental neutron activation analyses to provide rapid, multi-element assays of samples.

The Institute also operates the Water Resources Center which conducts research into the management, utilization, and preservation of our water resources. Some research projects are directed at improving the basic state of knowledge in hydrology, fluid mechanics, water chemistry, and biology; others are directly related to current problems of water supply, pollution control, flooding and erosion, and wastewater disposal. Typical current projects deal with the de-

tection and removal of pollutants such as phosphates, asbestos, ammonia, and heavy metals, and with the effects of these substances in the environment. Others are investigating the legal, social, and economic aspects of water use for industry, agriculture, and recreation; techniques for reducing damage by floodwaters; and the relationship between the efficient management of water resources and water demands for energy production.

Laboratory for Ergonomics Research

The facilities of the Laboratory for Ergonomics Research provide unique opportunities for pursuing interdisciplinary research on the interaction of man, his work, and his working environment. The laboratory provides an altitude chamber which accommodates six human beings, permitting simulation of altitudes to 45,000 feet. Air temperature and humidity may be controlled to permit investigations of the combined stresses of low environmental pressure and heat or cold. Additional controlled environmental rooms provide flexible areas where special test facilities may be installed. In addition, the laboratory serves as the focus of teaching and research in the course sequence in ergonomics offered jointly by the departments of physiology and biophysics, mechanical and industrial engineering, and physical education.

All departments and divisions of the University needing closely controlled environmental conditions for research or instructional work may utilize the special skills and equipment available in the laboratory.

Materials Research Laboratory

The Materials Research Laboratory supports research and the training of graduate students in the material sciences in cooperation with the departments of ceramic engineering, chemical engineering, chemistry, electrical engineering, geology, metallurgy and mining engineering, and physics. Interdisciplinary research basic to an understanding of the solid state of matter is stressed. The laboratory contains machine shops; cryogenic facilities; high temperature, toxic materials, x-ray, electron microscope, and electron microprobe laboratories; a chemical analysis laboratory with emission and mass spectrographic equipment; and a 3 MEV electron accelerator.

Radioisotope Laboratory

The Radioisotope Laboratory is an all-University facility for graduate training and research involving the use of the tracer technique with

hydrogen-2, hydrogen-3, carbon-13, and carbon-14. It is equipped with liquid scintillation spectrometers, vibrating reed electrometers, gas counters, radio-gas chromatography units, high vacuum systems, combustion setups, and auxiliary radiochemical equipment.

A prerequisite for research in the laboratory is Chemistry-Biochemistry 496, which emphasizes experimental techniques employed in the synthesis, degradation, isolation, establishment of purity, and assay of radioactive chemistry compounds. Members of the staff present this course one semester each year.

Cultural Resources

Students of the University of Illinois at Urbana-Champaign have a wide choice of activities ranging from rock concerts to scholarly colloquia, from experimental movies to major operatic productions. The four theatres which form the Krannert Center for the Performing Arts, the Assembly Hall, and many other facilities present a continuous round of music, drama, dance, and cinema. Distinguished public figures appear regularly on campus for symposia, lectures, forums, and public discussion. Three museums, The World Heritage Museum, The Natural History Museum, and Krannert Art Museum, serve the dual purposes of enjoyment and teaching. The University operates AM and FM radio stations as well as a television station.

Sports fans may look forward to exciting Big Ten competition, while those who enjoy participatory sports will find a complete range of facilities, from ice rinks to golf courses, and an extensive intramural sports program.

The Illini Union, the campus social center, offers lounges, dining facilities, and recreational and meeting rooms for individuals and groups. Special events are scheduled throughout the year featuring foreign foods and cultural activities.

The *Daily Illini,* the student newspaper, keeps the University community abreast of when and where these activities are available.

ADMISSION

General Requirements

The Graduate College considers for admission only those applicants who hold or will be granted at the end of the current academic year a baccalaureate or an equivalent degree comparable to that granted by the University of Illinois, and whose admission average is at least 4.0 on a scale of A=5.0. Admission averages are computed from the last sixty hours of undergraduate work and any graduate work completed. Individual departments may, however, set a minimum grade point average higher than that of the Graduate College and may impose other special admission requirements and conditions.

Applicants for admission to the Graduate College with undergraduate academic records showing "pass," "satisfactory," "credit," or other similar entries in advanced courses which have a bearing on the student's field of specialization should submit: (a) a written evaluation or letter grade by the instructor in each such course and (b) scores on the Graduate Record Examination Aptitude Test. Applicants for graduate programs in accountancy and business administration should use the Admission Test for Graduate Study in Business instead of the Graduate Record Examination.

Prospective students are urged to apply for admission as early as possible, preferably in November or December for the summer and fall terms; September or October for the spring term. Under no circumstances will applications be accepted during the two weeks preceding the beginning of a semester.

Admission forms may be obtained from the major department, the Graduate College, 330 Administration Building, or the Graduate and Foreign Admissions Office, 312 Mining and Metallurgy Building. A nonrefundable application fee of $20 must accompany the application.

Foreign applicants must submit official records of all higher educational training, including certificates of degrees, with the dates the degrees were conferred. Eligible applicants whose native language is not English must also take the Test of English as a Foreign Language (TOEFL), given several times a year throughout the world. Applicants should make arrangements directly with Educational Testing Service, Box 592, Princeton, New Jersey 08540, U.S.A. Foreign applicants must also submit evidence of financial support as a condition of admission.

Student Physical Examination

Each new student may be required to present evidence of satisfactory physical and mental health to the director of the Health Services at Urbana-Champaign. Each admitted applicant for admission will receive a Student Health Report form which he or she may use to report pertinent medical data to the director of the campus Health Service. Upon the advice of a Health Service physician, admission, readmission, *or continuing registration* of a student may be denied until the sudent is cleared by the McKinley Health Center.

Students transferring from the Chicago Circle or the Medical Center campuses should request that their Student Health Report forms be transferred by the health center on their campus to McKinley Health Center.

Military personnel may have their Student Health Report forms completed by a base physician.

Tuberculosis Control

All new, transfer, and readmitted students are encouraged to present evidence of freedom from tuberculosis at the Tuberculosis Control Center in the registration procedure. Foreign students are required to complete a chest x-ray at the Health Service before completing registration.

Evidence of freedom from tuberculosis is established by: (1) presentation of a University of Illinois or public health agency certificate (skin test or x-ray) dated within the previous twelve months, (2) undergoing the application of a tuberculin skin test at the Tuberculosis Control Center during registration with a negative interpretation by the University of Illinois Health Service forty-eight to seventy-two hours after application. Persons who have a positive reading to this test should have a chest x-ray at the University of Illinois Health Service, and (3) persons with a history of positive reaction to tuberculosis will not be skin-tested, but will be offered a chest x-ray at the Health Service.

Opportunities for the Physically Handicapped

The Division of Rehabilitation-Education Services provides special facilities and services for students with permanent physical handicaps: paraplegics, triplegics, polios, spastics, deaf, blind, and others needing help. Although preference is given to residents of Illinois, due to limitations on the number of physically handicapped students who can be accepted, properly qualified students from other states are considered.

Acceptance of physically handicapped students by the Office of Graduate and Foreign Admissions must be supported by joint approval of the McKinley Health Center and the Division of Rehabilitation-Education Services. Since the University may not be able to provide the necessary facilities for all who apply, early application for admission is essential.

TUITION AND FEES

Since tuition and fees are subject to change, usually in an upward direction, it is difficult to provide exact information. The most recent information concerning tuition charges, regular and special fees, exemptions, and refunds may be found in a leaflet available from the Office of Admissions and Records, 100a Administration Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

In general, however, the amounts assessed a resident of Illinois, including tuition, the service fee, and the hospital-medical-surgical fee, have been ranging each semester from about $151 for a minimum credit load to $317 for a full program and from $350 to $845 assessed non-residents for the same credit loads. Tuition and fees for the eight-week summer term total approximately two-thirds those for the full semester.

Residence Classification

The residence classification of an applicant is determined from information contained in the application for admission and other credentials provided by the applicant. Tuition is assessed in accordance with this decision.

A brochure, *Regulations Governing the Determination of Residency Status for Admission and Assessment of Student Tuition,* is available from the Office of Admissions and Records, University of Illinois at Urbana-Champaign, 177 Administration Building, Urbana, Illinois 61801.

Tuition and the service fee are waived for all academic employees of the University on appointment for at least 25 percent time but not more than 67 percent time, and for certain nonacademic employees. The nonresident portion of tuition and the service fee are waived for academic and administrative staff members on appointment with the University for 68 percent time or more.

Students who hold fellowships, traineeships, or other grants which cover tuition and fees will be informed of their exemptions at the time the award is offered.

The nonresident portion of tuition may be waived upon request for the spouses and dependent children of all staff members on University appointments of at least 25 percent time.

Rules regulating these and other exemptions from tuition, or fees, or the nonresident portion of tuition are listed in the leaflet referred to above.

Refunds

Tuition and fees will be refunded in full if the student withdraws before the first day of instruction, and in part if the withdrawal takes place during the first ten days of instruction (first five days in the summer session). No refunds will be made after this period.

Installment Plan for Payment of Fees and Housing Charges

Students enrolled on campus may arrange during registration to pay tuition, fees, and University residence hall charges (single student housing only) on an installment basis. This plan does not apply to registration in extramural and correspondence courses.

Tuition, fees, and residence hall charges for each of the first and second semesters are collected in four installments, the first payable at registration and the others in each of the following months. Summer session charges are payable in two installments.

Students paying tuition and fees by installment are assessed a $2 service charge. There is no service charge for installment payment of housing accounts. Arrangements for paying housing accounts on the installment plan are made at the time the contract is signed or during registration.

FINANCIAL AID

Financial assistance is available to promising students in all fields of study in the form of: (1) awards for which no services or repayments are required (fellowships and tuition and fee waivers), (2) teaching and research assistantships, (3) college work-study programs, and (4) loans. Any graduate student, present or potential, may apply to the University for financial aid in its several forms. Subject to the availability of funds, the following kinds of financial aid will be available.

FELLOWSHIPS

University Fellowships

Students in all fields of graduate study are eligible to compete for approximately 200 University Fellowships awarded on the basis of academic and scholarly achievement. University Fellowships provide a stipend of at least $2,500 for nine months or $3,000 for eleven months and a tuition and fee waiver. A fellow must carry a full program of four units or the equivalent and may accept, if offered, an assistantship of no more than one-quarter time.

Graduate College Fellowships

Students who show potential for success in graduate study, but who may have deficiencies in their undergraduate preparation, are eligible for Graduate College Fellowships. The fellowships are generally awarded to students beginning graduate work in order that the student may devote his first year entirely to study. The stipend and waiver are the same as those of University Fellowships; Graduate College permission is required for concurrent employment.

Graduate College Fellows who show satisfactory progress during their first year of graduate study usually receive some form of sup-

port with which to continue their programs. However, continued support cannot be guaranteed in advance.

University Summer Fellowships

These fellowships are restricted to graduate students who have held teaching assistantships at the University of Illinois at Urbana-Champaign the preceding year, who have earned not less than two units of graduate credit during that year, and who have demonstrated superior scholarship. Fellows are selected in a campus-wide competition. The stipend is $500 for the eight-week summer session and a tuition and fee waiver.

Industrial, Endowed, and Special Fellowships and Traineeships

Interested firms, foundations, and individuals support a variety of fellowship awards for graduate students; most are restricted to particular areas of study. The stipends and supplemental allowances for these fellowships vary; most provide for tuition and fees.

Federal Fellowships

Although federal funding has been curtailed sharply in recent years, certain fellowship and traineeship programs have been maintained. Some of these awards include dependency allowances and, almost without exception, provide for tuition and fees. Applicants for most federal fellowships and traineeships must be United States citizens or nationals.

Fellowships Awarded in National Competitions

Various kinds of fellowships are awarded by private foundations, industries and the federal government in rigorous national competitions which in most cases may be used at the college or university chosen by the recipient. Applications for these awards are obtained from and submitted directly to the granting agency. Among competitions of this type, the National Science Foundation Graduate Fellowship Program is the most prominent. Approximately five hundred fellowships in the mathematical, physical, medical, and biological sciences, engineering, social sciences, and in the history and philosophy of science are awarded through national competition each year. These fellowships are restricted to students who have completed not more than one year of full- or part-time graduate study; they may be continued for up to three years subject to the availability of funds and the student's satisfactory progress. Preliminary application materials are available early each fall from the Graduate College Fellowship Office, 311 Administration Building.

ASSISTANTSHIPS

The various departments of the University appoint graduate students as teaching or research assistants, usually for half-time service; the current salary for a half-time appointment is $394.45 per month and is subject to income taxes. Application should be made directly to the appropriate department. Assistants holding appointments ranging from 25 through 67 percent time are exempt from tuition and the service fee, but not from the hospital-medical-surgical fee.

A student may also apply for a part-time assistantship outside his major department in one of the nonteaching bureaus or agencies in the University such as the Institute of Government and Public Affairs, the Small Homes Council-Building Research Council, or the State of Illinois Natural History Survey.

Part-time appointments as student residence hall advisers are also available. These provide room and board, as well as the same exemption from tuition and the service fee accorded other assistants. Applications are available from the Student Affairs Coordinator for Staff Development, University of Illinois at Urbana-Champaign, 200 Clark Hall, Champaign, Illinois 61820.

Resignations

Students who resign their appointments before rendering service for at least three-fourths of the semester will be assessed tuition and fees unless they (a) withdraw from the University on the same date as the resignation; or (b) file a clearance form for graduation within one week following the date of resignation.

TUITION AND FEE WAIVERS

A number of tuition and fee waivers (in addition to those awarded in connection with fellowships and assistantships) are awarded each year in a campuswide competition. These waivers provide exemption from tuition and service fees, but not from the hospital-medical-surgical fee (currently $44 per semester), for the academic year and summer session immediately preceding or following. Students holding waivers must be in residence and must register for at least three units each semester during the academic year. They may also accept part-time or incidental employment not to exceed twenty hours a week, either with the University or with outside agencies.

Veterans who meet certain residence requirements may be eligible for exemption from tuition under the state statute concerning military scholarships. Further information may be obtained from the

Director of Student Financial Aids, 420 Student Services Building, 610 East John Street, Champaign, Illinois 61820.

HOW TO APPLY

Prospective graduate students may ensure consideration for fellowships (except those awarded in national competitions), waivers, and departmental assistantships by indicating that they wish to be considered for appointment in the appropriate spaces on the "Combined Application for Admission and Readmission to the Graduate College and Application for Graduate Appointment." Continuing students should apply, using the separate "Application for Graduate Appointment."

Financial need is not a consideration in awarding fellowships, assistantships, or tuition waivers administered by the Graduate College.

To be considered for summer or fall appointment, completed applications must be filed no later than February 15, but preferably early in January. (Some departments have earlier deadlines. For example, the School of Music deadline is February 1, with the exception of voice applications which are due January 15.) Departments may at their discretion, accept applications after the February 15 deadline; however, most departments choose assistants at the time fellowship applications are considered. A departmental committee may recommend a fellowship or tuition and fee waiver to the Graduate College, which makes final selection of the fellows and recipients of tuition and fee waivers. Each department appoints its teaching or research assistants, with approval of the Graduate College. Fellowships may be awarded only to students who are enrolled in or have applied for admission to the Graduate College as degree candidates.

LOANS AND COLLEGE WORK-STUDY

Graduate students may request information about National Direct Student Loans and College Work-Study from the Office of Student Financial Aids, 420 Student Services Building, 610 East John Street, Champaign, Illinois 61820. The application period begins in January of each year; the priority deadline for applications is March 12. Early application is advised, as funds are limited. NDSL loans and College Work-Study are based on financial need; the application may require documentation of such need as a result of a change in the law effective March 1, 1973. Loan and work-study applica-

tions are made separately from applications for fellowships, assistantships, or tuition and fee waivers.

Graduate students may also apply for guaranteed loans through lenders in their home towns who may participate in one of the various types of guaranteed loan programs. Applications should be submitted late in the spring term for the following academic year. Students are advised to delay processing the guaranteed loan application until they have received a response to their applications for fellowships, assistantships, tuition and fee waivers, NDSL loans, and College Work-Study. An information brochure, "Financial Aid for Students," and application forms are available from the Office of Student Financial Aids.

In addition to major educational loans, the University makes special funds available. Short-term emergency loans for a maximum of $100 must be repaid within sixty days, or by the end of the semester, whichever date is earlier. Intermediate loans in amounts not to exceed $200, subject to the availability of funds, may be made to help meet special financial needs of students. Repayment terms are the same as those for short-term emergency loans. Applications may be obtained from the Office of Student Services, 130 Student Services Building, 610 East John Street, Champaign, Illinois 61820.

ADVANCED DEGREES

GENERAL INFORMATION

Graduate Credit

Graduate credit is measured in terms of units, a unit being considered the equivalent of four semester hours. The normal program for a full-time graduate student is four units each semester or two units for an eight-week summer term. With the approval of the adviser the load may be increased to a maximum of five units in a semester, or two and one-half units in a summer term, provided the student is not employed.

Although credit earned by passing proficiency examinations cannot be applied to the credit requirements for an advanced degree, such examinations may be taken to fulfill prerequisites for more advanced courses or to demonstrate competence in an area considered to be important to a student's program of study. Students should consult their major advisers before applying for proficiency examinations.

Grading System

Final course grades are recorded: A, B, C, D (lowest passing grade), and E (failure), with numerical computations of grade-point averages based on a system where A=5.0. Other symbols in use, but not included in the computation of grade-point averages, are:

W — Officially withdrawn from a course.

Ex — Temporarily excused. An extension of time granted by the instructor to a student who has not completed the final examination or other requirements for the course. An excused grade must be replaced by a letter grade no later than the end of the next semester. Failure to complete the work within this time automatically results in a grade of E.

Df — Grade temporarily deferred. Used only in research courses and other approved courses which extend beyond one semester.

S or U — Satisfactory or unsatisfactory. Used only as final grades for the thesis research course (499) and in certain other approved courses.

CR or NC — Used only if a graduate student has registered for a course under the Credit-No Credit option with the approval of the major department.

Credit-No Credit Option (Formerly Pass-Fail)

Subject to restrictions imposed by the major department, a graduate student with the adviser's approval may register for graduate credit under this option with the understanding that the student must take at least two units of course work on the Urbana-Champaign campus with grades of A through D for every unit taken on a credit-no credit basis. Students may elect this option only during advance enrollment, during regular registration days, or within the first two weeks of the term.

Scholastic Requirements for Degree Conferral

The minimum average required by the Graduate College for an advanced degree is 3.75 (A=5.0); the average required by the major department may be significantly higher. The grade-point average (GPA) is computed at the end of each term and is shown on the Semester Grade Report mailed to each student as soon as possible after the final day of examinations. The GPA computation includes only units with grades of A through E. All other grades and credit for work completed elsewhere are excluded. A student who receives a grade of E should consult with his adviser as to the advisability of repeating the course. Repetition of the course, however, does not eliminate the original grade of E from the transcript or from the computation of the grade-point average.

A student who has completed four or more units with an average of less than 3.75 receives a warning letter from the Graduate College. If the average has not been raised to 3.75 on completion of four additional units or subsequently falls below 3.75, the student is disqualified as a degree candidate.

Minimum and Maximum Registration

Students holding fellowships awarded or administered by the University must carry a full program of four units or the equivalent each semester. Those awarded tuition and fee waivers must enroll in at least three units or the equivalent. Exceptions to these minima

are occasionally granted by the Graduate College on the recommendation of the fellows' major departments.

The maximum amount of credit for which a graduate student may register in a single term is limited by the Graduate College and by the departments, which may have lower maximum registration limits. Copies of the Graduate College regulation on maximum registration, including a table of enrollments for employed and unemployed graduate students, are available from the Graduate College and most departmental offices.

Interdisciplinary Programs

The "Programs of Study" section of this bulletin describes the programs of the various disciplines offered at the University of Illinois at Urbana-Champaign. Included are the offerings of several interdisciplinary areas of concentration such as Population Studies, Romance Linguistics, Latin American Studies, and Russian Language and Area Studies. In addition, an unlimited number of individually designed areas of concentration may be arranged for students enrolled in established degree programs. With the approval of the adviser and major department, a student may approach a specific problem by combining courses offered in various disciplines to achieve a specific educational objective.

Work Completed Elsewhere

A candidate for the doctorate who has received a master's degree from a recognized institution is considered to have completed the first stage of a doctoral program (see page 36). If the courses involved are to be used in partial fulfillment for the requirements for the doctorate, the candidate is examined on the content at the time of the preliminary examination.

A student who has completed graduate work in a recognized institution, but has not taken a degree, may petition to obtain transfer credit toward an advanced degree by passing examinations covering this work. Admission to such examinations requires the approval of the departments concerned; acceptance of credit requires the approval of the Graduate College. Credit which has been used in partial satisfaction of degree requirements elsewhere may not be transferred.

Credit for certain courses offered through interinstitutional arrangements to which the University of Illinois at Urbana-Champaign is a party may be obtained by petition. Under these circumstances the department involved may elect to waive the examination.

The acceptance of credit for work completed elsewhere does not reduce the residence requirement for an advanced degree described on page 23.

Time Limits for Advanced Degrees

A candidate for the master's degree must complete all requirements for the degree within five calendar years of initial registration in the Graduate College.

A candidate for the doctoral degree must complete all requirements within seven calendar years of initial registration in the Graduate College. Exception: a candidate who has received a master's degree elsewhere must complete all requirements for the degree within six years of initial registration in the Graduate College. A student whose program of study is significantly interrupted after receiving a master's degree from the University of Illinois and who later returns to work for the doctorate will have six years from the date of return to complete degree requirements.

Foreign Language Requirements

Each department determines its own foreign language requirement, if any, or the options that may be substituted. Special courses without graduate credit, designed for students preparing to meet a language requirement, are offered by the foreign language departments.

Conferring of Degrees

Advanced degrees are conferred in January, May, August, and October; the doctorate is not awarded in August. No student may be awarded more than two graduate degrees for work completed at the University of Illinois.

THE MASTER'S DEGREE

The Graduate College credit requirement for the master's degree is at least eight units, three of which must be in courses numbered in the 400 series; two of these three units must be in the major field. At least one-half of the minimum units required for the master's degree must be in courses meeting on the Urbana-Champaign campus, or in courses meeting in other locations and approved by the Graduate College for residence credit.

Thesis

Most departments require or offer as an option in their master's degree programs a thesis, reflected on the student's record as registration in 499, Thesis Research. No more than three units of thesis credit may be included in an eight-unit program. Credit in thesis research may not be applied to a degree unless a thesis is accepted by the department and the Graduate College. The thesis must be the work of a single author.

For specific instructions regarding the format of the thesis, the student should obtain a copy of the leaflet *Instructions for Preparation of Theses* from the Graduate College Thesis Office, 311 Administration Building.

Master's Degrees in Teacher Education

Master's degrees in teacher education require at least four units of graduate study in the major field, two units of electives, and two units in education. Detailed information concerning specific requirements within these areas, as approved by the Graduate College and the Urbana Council on Teacher Education, may be obtained from appropriate departmental offices and advisers.

A limited number of applicants who have not completed requirements of a four-year undergraduate curriculum leading to teacher certification may be admitted to these programs on the approval of the appropriate adviser and the Coordinator of Teacher Education. Such students must complete teacher certification requirements, as well as the usual program requirements, in order to qualify for the master's degree in teacher education.

In general, the graduate student admitted with certification deficiencies must meet the general education requirements and teaching field requirements equivalent to those of the appropriate undergraduate curriculum as determined by the adviser. Teacher certification requires a minimum of eighteen semester hours of professional education, including student teaching. Graduate courses in professional education may be applied toward fulfillment of certification requirements.

Students wishing to pursue both certification and master's degree requirements may obtain information from the Office of the Coordinator of Teacher Education, University of Illinois at Urbana-Champaign, 140 Education Building, Urbana, Illinois 61801.

THE DOCTOR OF PHILOSOPHY DEGREE

Credit and Residence Requirements

The Graduate College credit and residence requirements for the doctoral program involve three stages and include a minimum of twenty-four units. At least sixteen units, including thesis credit, must be in courses meeting on the Urbana-Champaign campus or in courses meeting in other locations and approved by the Graduate College for residence credit.

The *first stage* is completed when the student receives the master's degree or earns the equivalent credit (eight units); the *second stage* is completed when the departmental course and credit requirements have been fulfilled and the student has passed the preliminary examination; the *third stage* is devoted to research, seminars, the dissertation, and the final examination. Continuous registration (excluding summer sessions) must be maintained until the credit requirement has been satisfied.

Doctoral Examinations

Committees to administer preliminary and final examinations are composed of three or more faculty members appointed by the Dean of the Graduate College. All faculty members with the rank of assistant professor or above are eligible for appointment, but the committee's chairman and a majority of its members must be members of the graduate faculty. Preliminary examinations may take a variety of formats, all of which must be approved by the Graduate College; final examinations are oral and public. The candidate is admitted to the final examination by the Dean of the Graduate College on completion of the dissertation and the recommendation of the major department. Failure to complete the degree requirements within five years of passing the preliminary examination will require retaking of the examination.

Thesis

The Doctor of Philosophy is primarily a research degree; thus the candidate must demonstrate a capacity for independent research by the production of an original thesis on a topic within a major field of study. The subject of the thesis must be reported to the doctoral committee and to the Graduate College at the time of the preliminary examination. The thesis must be the work of a single author.

Candidates engaged in thesis research may find it desirable or expedient to publish, prior to the conferral of the degree, certain findings that later will be incorporated in the dissertation. In this case appropriate acknowledgment of the earlier publication should be included in the dissertation. The Graduate College encourages such publication, but the thesis in its entirety may not be published before all degree requirements have been completed.

Detailed directions for the preparation and deposit of theses are provided in the bulletin "Instructions for Preparation of Theses" obtainable from the Graduate College Thesis Office, 311 Administration Building.

Advanced Certificate

Several colleges and schools offer an advanced certificate for those interested in additional professional training beyond the master's degree but who are not interested in obtaining the doctorate. Usually the program requires the completion of eight units of course work.

Nondegree Students

As a public service, graduate departments may permit students who hold the baccalaurate degree and meet all other admission requirements, but who have no degree aspirations, to enroll in graduate courses on a course available basis.

SPECIAL PROGRAMS AND SERVICES

CIC Traveling Scholar Program

The Committee on Institutional Cooperation, a voluntary association of the Big Ten universities and the University of Chicago, has established the Traveling Scholar Program as part of its effort to increase cooperative use of its member institutions' resources. The program enables doctoral-level students to attend other CIC institutions in order to take advantage of special course offerings, laboratory facilities, or library collections. Visits of traveling scholars are limited to one year. Traveling scholars register and pay regular fees at their home universities. Credit earned while in this program is automatically accepted by the home university.

Application forms are available from the Graduate College, 330 Administration Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801.

International Programs and Studies

The University of Illinois offers many opportunities for graduate students to pursue international studies both at home and abroad. Graduate student research forms an integral part of University projects in Costa Rica, Colombia, Iran, Puerto Rico, Tunisia, and other countries. Research opportunities are available through the Center for International Comparative Studies, the Center for African Studies, the Center for Asian Studies, the Center for Latin American and Caribbean Studies, the Center for Russian and East European Studies, the Illinois Tehran Research Unit and many departments. For full information on these opportunities, as well as other graduate study abroad programs and a wide range of

courses and seminars in international studies, write for the handbook "International Programs and Studies at the University of Illinois at Urbana-Champaign," obtainable from the Office of International Programs and Studies, 309 Illini Tower, 409 East Chalmers Street, Champaign, Illinois 61820.

In addition, overseas teaching opportunities are available in Music Education, English as a Second Language, and some of the modern foreign language departments. Interested students should contact the executive officer of the appropriate department or division.

Extramural Courses

Graduate courses in several areas of study are offered by members of the University of Illinois at Urbana-Champaign faculty at various centers throughout the state. Pamphlets listing these courses may be obtained from the Office of Continuing Education and Public Service or the Graduate College. Such extramural courses are designated by an "E" preceding the course number. Credit earned in extramural courses may be applied toward an advanced degree only if the courses have been approved in advance by the student's advisor and constitute a part of a well-integrated program. Credit from extramural courses not approved for residence credit may not be applied to the second stage of a doctoral program.

R Courses

Extramural courses which have been approved for residence credit are designated by an "R" preceding the course number. At least half the minimum units required for a master's degree must be earned in courses meeting on the Urbana-Champaign campus or in courses bearing the "R" designation.

Correspondence Courses

Credit earned from correspondence courses may not be applied toward an advanced degree, but may be used to fulfill prerequisites or remove deficiencies. A catalogue of correspondence courses may be obtained from the Office of Continuing Education and Public Service, 103 Illini Hall, University of Illinois at Urbana-Champaign, Champaign, Illinois 61820.

MEDICAL SERVICES

All students enrolled in credit courses and in attendance at the Urbana-Champaign campus are assessed a hospital-medical-surgical

(HMS) fee which covers two separate functions: health service at the McKinley Health Center and group health insurance.

Health Service

The McKinley Health Service portion of the HMS fee supports the medical services available at the McKinley Health Center located on campus. Dependents are not eligible for care at the health center unless they are also enrolled students at the Urbana-Champaign campus. Four basic types of care are available: routine office care (outpatient section), care requiring hospitalization (inpatient section), care for injuries or acute illnesses (emergency room), and mental health care (outpatient clinic and inpatient hospitalization).

Health service physicians are available for general medical care and advice while the student is on campus. They are experienced clinicians, most of them having practiced for years as family physicians. Students may consult the health service physician of their choice by appointment. Care is similar to that offered by a private, general physician. A wide range of diagnostic tests is available to the health service physician, including laboratory procedures, x-ray examinations, and electrocardiograms. A limited pharmacy provides drugs for students when they are under the care of a health service physician.

The inpatient section of McKinley Health Center (McKinley Hospital) is a fifty-eight-bed medical hospital owned by the University and fully accredited by the Joint Commission on Accreditation of Hospitals. The medical staff includes both community and health service physicians.

A health service physician is available twenty-four hours a day for students or employees injured on the job who require emergency care.

Health service care provided by the McKinley Health Center does not depend on and is not reimbursed by any insurance plan the student may have.

Group Health Insurance

The University insurance plan provides worldwide hospital-medical-surgical coverage. The insured student has a free choice of any legally qualified hospital or licensed physician (McKinley health services excepted). The coverage is provided on a semester basis and includes all holidays in the semester and the period between semesters. The policy provides hospital-medical-surgical insurance up to $10,000 as defined in the insurance certificate furnished to each student at registration.

Summer Coverage

Students enrolled in the second semester who do not plan to attend the summer session may elect to extend the insurance for the entire summer vacation period by making application and paying the insurance portion of the HMS fee to the Insurance Office, University of Illinois at Urbana-Champaign, B6 Coble Hall, 801 South Wright Street, Champaign, Illinois 61820, between May 15 and the fifth day of instruction of the summer session. Coverage of the insured student's eligible dependents may also be extended for this period. This does not include medical services at the McKinley Health Center.

Exemption from the Insurance Fees

Students presenting evidence of equivalent medical insurance coverage will be exempted from payment of the fee for the University Insurance Plan upon approval of a petition submitted to the University Insurance Office during regular registration, or within the first ten days of instruction in any semester, or within the first five days of instruction in the summer session.

HOUSING

Single Graduate Students

The University maintains housing for single graduate students in two residence hall complexes within easy walking distance of the campus. Each study room is furnished and directly connected with a complete bath shared with the occupant(s) of one or two other rooms. Single and double rooms are available. Excellent lounge facilities, laundry service rooms, and vending machines provide the essential features of day-to-day living. A contract for food service in undergraduate dining halls may be arranged.

Married Graduate Students

Furnished efficiency, one-bedroom, and two-bedroom apartments are available to married students. Some two-bedroom units are unfurnished, but include stoves and refrigerators. Convenient laundry facilities are available.

The Housing Division also maintains a current listing of private apartments and rooms available in homes in the community. Students seeking private housing are urged to visit the campus as early as possible, as all reservations for this type of accommodation must be made in person. Anyone unfamiliar with standard leasing prac-

tices should ask a Housing Division consultant for assistance in reviewing the terms of a lease. In some instances, when demand for this type of accommodation is at a peak, it may be necessary to reserve an apartment as much as three months prior to the opening of the school term.

Applications for accommodations in University graduate residence halls or University-owned apartments for married students may be obtained from the Housing Information Office, 420 Student Services Building, University of Illinois at Urbana-Champaign, Champaign, Illinois 61820. Assignments are made and leases issued to applicants until all available space has been assigned. Priority in assignment is determined by the date the completed application is received by the Housing Division. No discrimination in any of these facilities may be made with respect to race, religion, and national origin. Private housing listed must also comply with this policy.

PROGRAMS OF STUDY

The graduate programs offered by the Graduate College, through the various divisions, schools, institutes, centers, and departments of the University of Illinois at Urbana-Champaign, are described on the following pages; areas of specialization within these programs, and minimum requirements for admission to them, are included. The prospective student is reminded that he or she is seeking admission to the Graduate College of the University of Illinois at Urbana-Champaign, and may not be admitted to the College or to a particular academic department offering programs leading to advanced degrees without satisfying the admissions requirements of both.

The University of Illinois at Urbana-Champaign *Courses Catalog,* published biennially, lists all the undergraduate and graduate courses offered at the Urbana-Champaign campus. A listing of courses offered each term is published in the *Timetable,* issued in April for the fall term, in May for the summer term, and in November for the spring term. Copies of these publications may be obtained by writing to the Graduate College, 330 Administration Building, University of Illinois at Urbana-Champaign, Urbana, Illinois, 61801, or to individual departments, which also issue brochures describing in detail the features of their programs.

ACCOUNTANCY

Head and Director of Graduate Studies: N. M. Bedford
Correspondence and Information: Head of the Department of Accountancy, University of Illinois at Urbana-Champaign, 360 Commerce Building (West), Urbana, Illinois 61801

FACULTY

Professors: N. M. Bedford, G. D. Brighton, R. I. Dickey, C. F. Dunham, P. E. Fess, H. P. Holzer, O. E. Johnson, F. L. Neumann, K. W. Perry, H. M. Schoenfeld, W. E. Thomas, V. K. Zimmerman
Associate Professors: E. L. Elliott, R. E. Flaherty, J. C. McKeown, R. J. Petersen
Assistant Professors: S. Albrecht, W. M. Lemon, L. L. Lookabill, H. W. Melton, D. H. Patz, R. D. Picur, J. J. Schultz, S. Yu, R. E. Ziegler

Graduate Programs. The Department of Accountancy offers graduate work leading to the degrees of Master of Accounting Science and Doctor of Philosophy in Accountancy. For graduates of business schools with credit in appropriate undergraduate courses, the M.A.S. degree requirements can be completed in one year. For nonbusiness graduates, the M.A.S. can be earned in two years. The Ph.D. degree takes approximately three years of full-time study and research.

Admission. All applicants, native or foreign, are required to take the Graduate Management Admission Test. This test should be taken early enough to insure that the results will be available to the department prior to action on admission.

Master of Accounting Science. All candidates take three specified graduate-level courses in accountancy. No thesis is required, although the student may elect to write one. In addition, graduate courses in microeconomic theory, operations research, and organization theory must be taken if such courses were not taken in prior academic work.

A candidate with an undergraduate background in accounting is required to complete at least eight units of work, four of which must be in accountancy. Such a student should have completed an equivalent of the undergraduate curriculum at the University of Illinois at Urbana-Champaign including the following: twenty-one hours of undergraduate work in accounting; introductory courses in economic theory, in computer programming and applications, and in the functional fields of business; two courses in statistics; and courses in finite mathematics and calculus.

A student with little or no business and accounting background is required to complete sixteen units of work, or the equivalent. A first-year student takes four specified graduate courses in accountancy. Depending upon background, the student also enrolls in courses in statistics, economics, operations research, enterprise organization, finance, and marketing. A student who already meets some of the requirements of the two-year program may be given some credit toward the sixteen-unit requirement. Elective courses may be substituted in areas in which such a student satisfactorily demonstrates proficiency. In the second year the requirements for all M.A.S. students, as described above, are followed.

Adequate provisions have been made for electives suited to the particular interests of both one-year and two-year M.A.S. students.

Doctor of Philosophy. Applications for admission to the doctoral program, supported by three letters of recommendation, must be approved by the department admissions committee, which may require an oral or written examination. The requirements for the Doctor of Philosophy degree include the following: credit in micro- and macroeconomics; two courses in statistics, one course in organization behavior, and two courses in research methods and techniques; a minor of at least three units other than accountancy; at least six units of accountancy; and additional units to bring the total to at least twenty-four, including the eight dissertation units. The student's

doctoral program is determined in consultation with a faculty adviser. The student's tentative plans for the doctoral dissertation serve as a guidepost in planning the program.

In addition, the candidate must pass an oral and written preliminary examination and an oral final examination on his doctoral dissertation. In the preliminary examinations, the candidate must demonstrate a thorough knowledge of accounting theory in both its external and internal dimensions, of research methods, and of the areas of accountancy in which he specialized; a general acquaintance with the subject matter and bibliography of other areas of accountancy; and proficiency in his minor field and the required areas of economic theory, quantitative methods, and organization theory.

CENTER FOR INTERNATIONAL EDUCATION AND RESEARCH IN ACCOUNTING

The Center for International Education and Research in Accounting is functionally and administratively a constituent part of the Department of Accountancy. The center's objective is to foster the international development of education and research in the accounting discipline, to provide a base for the international exchange of ideas and materials, to carry out research programs of international interest, and to assist accounting faculty and able students from other countries to come to the University of Illinois at Urbana-Champaign for study and research in accountancy. The staff of the center, composed of outstanding teachers and researchers from foreign countries, conduct seminars and courses for graduate credit.

Inquiries concerning the center should be directed to Professor V. K. Zimmerman, Director, Center for International Education and Research in Accounting, University of Illinois at Urbana-Champaign, 320 Commerce Building (West), Urbana, Illinois 61801.

ADVERTISING

Head of the Department: S. Watson Dunn
Correspondence and Information: Head of the Department of Advertising, University of Illinois at Urbana-Champaign, 103 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: A. M. Barban, S. W. Dunn, N. Wedding
Associate Professors: K. B. Rotzoll, G. E. White
Assistant Professors: J. E. Haefner, J. D. Leckenby, S. F. Tinkham

Graduate Program. The Department of Advertising offers graduate work leading to the Master of Science in Advertising. For the program leading to the Doctor of Philosophy in Communications, see page 67.

Admission. Admission to graduate study in advertising requires completion of the requirements for a bachelor's degree in an institution of recognized standing. All applicants are urged to take either the Graduate Record Examination or the Admission Test for Graduate Study in Business and are required to attach to their application a short essay indicating why they want to take graduate work in advertising.

Master of Science. Candidates for this degree must complete nine units, of which at least four are 400-level courses. Registration must include five units in advertising, including Advertising 481, Advertising 482, and either Advertising 483 or Advertising 484. At least two units of non-advertising courses are required. Most students, either with or without an undergraduate major in advertising, earn the Master of Science degree in one calendar year.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Head of the Department: H. S. Stillwell
Director of Graduate Studies: H. H. Hilton
Correspondence and Information: Director of Graduate Studies, Department of Aeronautical and Astronautical Engineering, University of Illinois at Urbana-Champaign, 101 Transportation Building, Urbana, Illinois 61801

FACULTY

Professors: C. E. Bond, H. H. Hilton, C. O. Hopkins, H. W. Knoebel, Y. K. Lin, R. W. McLoy, A. I. Ormsbee, S. N. Roscoe, H. S. Stillwell, R. A. Strehlow, S. M. Yen, A. R. Zak
Associate Professors: H. O. Barthel, H. Krier, J. E. Prussing, L. H. Sentman, K. R. Sivier

Graduate Programs. The Department of Aeronautical and Astronautical Engineering offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy. Study and research are planned to prepare graduates for fundamental and applied work in airplane, missile, and space flight engineering. Students interested in mass transportation and deep sea submergence vehicles, for example, find the graduate study in this department very applicable. Typical areas of concentration are aerodynamics, aeroelasticity, space mechanics, flight mechanics, propulsion, structural mechanics, optimization and control, manual control and display systems, human factors in aerospace systems, and air and noise pollution.

Admission. The prerequisite for graduate study normally is the equivalent of the undergraduate courses required at the University of Illinois for a bachelor's degree in aeronautical and astronautical engineering; however, graduates of curricula leading to degrees in other fields of engineering, the physical sciences, or mathematics may also be admitted to advanced study.

Master of Science. Candidates for the degree of Master of Science are required to complete a minimum of eight units of graduate work, including a thesis. It is possible for a student with a one-half time appointment to complete the requirements for the M.S. degree in two regular semesters and a summer session, or three regular semesters.

Doctor of Philosophy. Because of the wide range of interests in the field of aeronautical and astronautical engineering, there are no specific course requirements for a major in the program of study leading to the degree of Doctor of Philosophy. Each student plans a study program in consultation with a departmental adviser. Courses offered by departments other than aeronautical and astronautical engineering may be included in the major area of study when these courses are of particular value to the work which students desire to emphasize. The major and minor programs must meet with the approval of the head of the department. Minimum requirements for the degree consist of eight units of course credit beyond the master's degree, successful completion of the preliminary examination, and a satisfactory thesis developed from eight units of thesis research. A reading knowledge of one foreign language is required.

AGRICULTURAL ECONOMICS

Head of the Department: Daniel I. Padberg
Correspondence and Information: Head of the Department of Agricultural Economics, University of Illinois at Urbana-Champaign, 304 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: C. B. Baker, G. K. Brinegar, E. E. Broadbent, B. L. Brooks, F. Dovring, J. M. Due, D. E. Erickson, R. L. Feltner, L. P. Fettig, F. C. Fliegel, J. W. Gruebele, H. D. Guither, H. G. Halcrow, J. H. Herbst, T. A. Hieronymus, L. D. Hill, R. A. Hinton, G. G. Judge, N. G. P. Krausz, A. G. Mueller, D. I. Padberg, F. J. Reiss, J. W. Robinson, J. R. Roush, S. C. Schmidt, J. T. Scott, R. G. F. Spitze, E. R. Swanson, R. N. Van Arsdall, V. I. West, S. W. Williams
Associate Professors: C. A. Bock, T. L. Frey, A. G. Harms, E. D. Kellogg, M. B. Kirtley, R. M. Leuthold, W. D. Seitz, D. G. Smith, A. J. Sofranko, J. C. van Es, M. M. Wagner
Assistant Professors: T. E. Elam, D. A. Lins, S. T. Sonka, D. L. Uchtmann

Programs and Fields of Study. The Department of Agricultural Economics offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Study programs can be organized with concentrations in production economics and resource organization, agricultural marketing and prices, agricultural economic policy, firm management and decision making, agricultural finance, quantitative methods and research methodology, international agricultural development, natural resource economics and regional development, international trade, rural sociology, and agricultural law.

Admission. Students having less than twelve hours of agricultural economics and economics may be required to take additional courses to adequately prepare them for graduate study. Students who desire to specialize in rural sociology should have had a minimum of six hours of sociology.

Master of Science. Two units of economics, at least one of which must be economic theory; four units of agricultural economics, including thesis credit; and two units of open electives make up the minimal eight-unit program. At least three units must be 400-level courses, two of which must be agricultural economics. No more than two units of thesis credit may be included in the eight unit program. The thesis may be waived under certain circumstances. The program is designed to be completed in one year of full-time study.

Doctor of Philosophy. The doctoral candidate must complete eight units of non-thesis courses beyond the M.S. degree. The total graduate program must include a minimum of three units in economics, including one unit each of micro and macro theory, both at the 400 level, and two and one-half units in quantitative methods and research methodology. The student must pass written and oral preliminary examinations, submit an acceptable dissertation, and pass a final oral examination.

For further information and a copy of the graduate program brochure, write to the address noted above.

AGRICULTURAL EDUCATION

Chairman of the Agricultural Education Division, College of Education: Paul E. Hemp
Assistant Dean, College of Agriculture: Cecil D. Smith
Correspondence and Information: Division of Agricultural Education, University of Illinois at Urbana-Champaign, 357 Education Building, Urbana, Illinois 61801

FACULTY

Professors: P. E. Hemp, L. J. Phipps
Associate Professor: R. W. Walker
Assistant Professor: B. E. Swanson

Graduate Programs. The Master of Science in Agricultural Education has been planned as a fifth year of work for students who have completed the requirements of the four-year agriculture curriculum for secondary teachers of agricultural occupations, or its equivalent.

Admission. The program is open only to students who have met the requirements for teaching agriculture.

Master of Science. Candidates must earn four units in agriculture, two units in education, and two units in electives, which may be in agriculture, education, or, in exceptional cases, in other fields.

A minimum of four units must be taken in residence, A maximum of four of the required eight units may be earned in extramural courses offered by the University of Illinois; of these four units, no more than two units may be in agriculture and no more than two units may be in education.

In order to fulfill one of the objectives of this program, that of broad general training in technical agriculture at the graduate level, the agriculture courses and electives must be selected with the approval of the adviser. In general, agriculture courses are selected from at least three subject-matter departments with no more than three units from any department.

Advanced Graduate Degree Program. Students who wish to pursue work at the doctoral level with a major in agricultural education should review program descriptions and requirements listed for the Department of Vocational and Technical Education in the College of Education.

AGRICULTURAL ENGINEERING

Head of the Department: Frank B. Lanham

Correspondence and Information: Head of the Department, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign, 245 Agricultural Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: B. J. Butler, J. O. Curtis, D. L. Day, R. F. Espenschied, D. R. Hunt, D. G. Jedele, B. A. Jones, Jr., F. B. Lanham, A. J. Muehling, E. F. Olver, H. B. Puckett, E. D. Rodda, G. C., Shove, J. A. Weber, R. R. Yoerger

Associate Professors: C. W. J. Drablos, D. L. Hoag, W. R. Nave, J. C. Siemens

Assistant Professors: L. E. Bode, J. K. Mitchell, D. H. Vanderholm, P. N. Walker

Graduate Programs. The Department of Agricultural Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. The student may specialize in power and machinery (soil dynamics, tillage, noise and vibration, vehicle stability, operations analysis, pesticide application, and harvesting efficiency); soil and water mechanics (hydraulics of structures, agricultural hydrology, drainage, mechanics of erosion, and water quality); farm structures (structural analysis and design, environmental control, air contaminates, and waste disposal); or processing (systems analysis for farmstead mechanization, crop conditioning and processing, physical properties of agricultural products, and food engineering).

Requirements. Candidates must have completed the equivalent of the undergraduate curriculum at the University of Illinois. Candidates for the Doctor of Philosophy must fulfill all the standard requirements of the Graduate College, The program provides for a major in agricultural engineering with a minor in other graduate departments of engineering, mathematics, physics, or other disciplines in the physical sciences.

Opportunity for independent study and research is an important part of both the Master of Science and the Doctor of Philosophy programs. Research opportunities

are available in both the Agricultural and Engineering Experiment Stations. For the master's degree, a thesis involving an analytical or experimental investigation and satisfying about one-fourth of the credit for the program is normally required.

AGRONOMY

Head of the Department: ROBERT W. HOWELL
Correspondence and Information: Head, Department of Agronomy, University of Illinois at Urbana-Champaign, W-201 Turner Hall, Urbana, Illinois 61801

FACULTY

Professors: D. E. ALEXANDER, A. H. BEAVERS, R. L. BERNARD, J. S. BOYER, A. W. BURGER, S. G. CARMER, R. L. COOPER, J. M. J. DE WET, J. W. DUDLEY, J. B. FEHRENBACHER, J. W. GERDEMANN, D. W. GRAFFIS, H. H. HADLEY, R. H. HAGEMAN, J. B. HANSON, J. R. HARLAN, C. N. HITTLE, A. L. HOOKER, R. W. HOWELL, J. A. JACKOBS, R. L. JONES, E. L. KNAKE, L. T. KURTZ, J. R. LAUGHNAN, M. G. MCGLAMERY, G. E. MCKIBBEN, S. W. MELSTED, D. A. MILLER, T. R. PECK, D. B. PETERS, W. O. SCOTT, R. D. SEIF, F. W. SLIFE, G. F. SPRAGUE, F. J. STEVENSON, M. D. THORNE, W. M. WALKER, L. F. WELCH, C. M. WILSON
Associate Professors: J. D. ALEXANDER, J. E. HARPER, R. C. HILTIBRAN, T. D. HINESLY, T. HYMOWITZ, C. J. KAISER, D. E. KOEPPE, R. J. LAMBERT, W. L. OGREN, E. B. PATTERSON, B. W. RAY, R. W. RINNE, E. W. STOLLER, L. M. WAX, E. J. WEBER, J. M. WIDHOLM, J. T. WOOLLEY
Assistant Professors: W. L. BANWART, C. W. BOAST, M. A. COLE, J. J. FAIX, J. J. HASSETT, R. G. HOEFT, I. J. JANSEN, R. R. JOHNSON, E. H. PASCHAL, D. K. WHIGHAM

Graduate Programs. The Department of Agronomy offers graduate work leading to the Master of Science and Doctor of Philosophy. The student may specialize in crops (breeding and genetics, evolution, production, morphological development, physiology, plant chemistry, weeds and their control); soils (biology, chemistry and biochemistry, fertility, genesis, morphology and classification, management, physical and colloidal chemistry, physical edaphology, physics); biometry; environmental agronomy; or international agronomy. Arrangements can sometimes be made for thesis research to be done abroad.

Admission. Adequate preparation for graduate work in soils includes courses in physics, chemistry, geology, microbiology, and mathematics; in crops, courses in botany, chemistry, genetics, and statistics; in biometry, courses in mathematics, statistics, and computer programming.

Master of Science. A candidate must complete eight units of graduate study with G.P.A. of at least 4.0 and must present an acceptable thesis and pass an oral examination. At least three units must be in the 400 series, including at least one unit for course work other than Agronomy 499. The thesis may be waived by petition.

Doctor of Philosophy. A candidate must complete a minimum of twenty-four units of graduate study and must demonstrate competence in two foreign languages or take one and one-half units or equivalent of course work in lieu of each language. At least four units of 300- or 400-level courses outside the Department of Agronomy are required.

ANIMAL SCIENCE

Head and Graduate Supervisor: D. E. BECKER
Correspondence and Information: Head of the Department of Animal Science, University of Illinois at Urbana-Champaign, 328 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: D. H. Baker, E. M. Banks, D. E. Becker, O. G. Bentley, D. J. Bray, J. E. Corbin, P. J. Dziuk, R. M. Forbes, U. S. Garrigus, E. E. Hatfield, F. C. Hinds, A. H. Jensen, S. P. Mistry, A. V. Nalbandov, A. L. Neumann, H. W. Norton, B. A. Rasmusen
Associate Professors: W. W. Albert, W. F. Childers, S. E. Curtis, P. C. Harrison, J. M. Lewis, J. R. Romans, G. R. Schmidt
Assistant Professors: D. B. Anderson, J. M. Bahr, T. R. Carr, G. F. Cmarik, T. R. Tyler

Admission. Courses in biological and physical sciences and mathematics are essential preparation for graduate work in any specialized area of animal science. Candidates specializing in the areas of animal nutrition or nutritional biochemistry must have training equivalent to one five-hour course each in quantitative analysis and organic chemistry; a course in physical chemistry is strongly recommended. Candidates specializing in meat science should have undergraduate training in meat evaluation, use, and/or processing, and in microbiology. Students lacking adequate background to register in graduate courses at the University of Illinois are expected to remove course deficiencies during the first year of graduate study. The department desires applicants with a strong undergraduate degree in animal science and with real promise of completing degree requirements in reasonable time.

Graduate Program. The Department of Animal Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Study and research may be pursued in the following areas of specialization: population and immunogenetics, physiology of reproduction including endocrinology, environmental physiology, animal nutrition, nutritional biochemistry, meat science and muscle biology, and world animal agriculture. Beef cattle, horses, poultry, sheep, swine, and a wide variety of laboratory animals are available for study.

Master of Science. The Master of Science in Animal Science may be completed with or without a thesis. Candidates are required to complete a minimum of eight units of graduate work. At least three units must be in 400-level courses, two of which must be in animal science. No more than two units of thesis credit may be included in the program. Candidates are required to register in Animal Science 400, Seminar, during each semester of study.

Doctor of Philosophy. The doctoral candidate must complete at least eight units of non-thesis courses beyond the M.S. degree. The program of study must include registration in Animal Science 400, Seminar, during each semester of study. The student must pass written and oral preliminary examinations administered by a committee of at least five faculty members, two of which must be from outside the Department of Animal Science. The candidate must also complete eight units of thesis research and submit an acceptable thesis. The final examination is limited to a presentation and defense of the thesis research.

ANTHROPOLOGY

Head of the Department: Eugene Giles
Director of Graduate Studies: F. K. Lehman
Correspondece and Information: Graduate Secretary, Department of Anthropology, University of Illinois at Urbana-Champaign, 109 Davenport Hall, Urbana, Illinois 61801

FACULTY

Professors: E. M. Bruner, J. B. Casagrande, C. E. Cunningham, E. Giles, H. A. Gould, D. W. Lathrap, F. K. Lehman, J. C. McGregor (Emeritus), B. Nettl, D. W. Plath, D. B. Shimkin, V. C. Uchendu, N. E. Whitten, Jr., R. T. Zuidema

Asssociate Professors: D. S. Butterworth, D. C. Grove, C. M. Keller, H. M. Ross
Assistant Professors: C. J. Bareis, J. C. Brukman, L. W. Crissman, L. K. Klepinger, B. J. Peterson, W. E. Peterson, T. J. Riley, J. O. Stewart, R. W. Thompson

Graduate Programs. The Department of Anthropology offers work leading to the degrees of Master of Arts and Doctor of Philosophy. The master's degree can be a first stage toward the doctorate or can be used by students wishing ultimately to apply a knowledge of anthropology in some related field. The doctoral program is designed primarily to train scholars and teachers of the subject, but also increasingly to prepare professionals to work in nonacademic contexts; the master's degree is not required of all students going on to the doctorate. Courses and guided study provide broad coverage with concentration in the ethnology of Latin America, aboriginal North America, Japan, China, Indonesia, South and Southeast Asia, Africa south of the Sahara, and Oceania; cultural, historical, and archaeological methods; culture change and modernization in complex societies; urban anthropology; human ecology, structural, and formal analysis of cultural systems; and ethnolinguistics and ethnomusicology. Relevant courses are offered in other fields, such as linguistics, history, sociology, geography, agricultural economics, life sciences, and preventive medicine, The department also helps support student attendance at field schools and study in mathematics, languages, and related subjects at summer institutes.

Opportunities for original research in the field, laboratory, and library include participation in faculty research projects, attendance at University of Illinois archaeological and ethnological field schools held every summer, as well as independent graduate student research in the United States and abroad. Library and computer facilities on campus are outstanding.

Admission. A student without the equivalent of this department's undergraduate major may be permitted to register for graduate courses but will be required to make up any deficiencies in this background.

Master of Arts. A candidate for the master's degree must accumulate at least eight units of graduate credit and present an acceptable thesis or essay in lieu of thesis. The degree should be earned in not more than two years.

Doctor of Philosophy. A candidate for the doctor's degree must take at least eight units beyond those for the master's and must present a predoctoral research paper of substantially original content before the preliminary examinations. The student will then undertake extended original research leading to a thesis, which is defended for the degree. The doctoral degree normally takes from four to six years to earn. The student must demonstrate ability to use for scholarly purposes either one foreign language at a high level of proficiency or two at ordinary reading proficiency. The level to be tested and languages will be chosen by the student's advisory committee, which is appointed early in the student's second year of residence.

ARCHITECTURE

(Including Architectural Engineering)

Head of the Department: G. Day Ding
Chairman Graduate Admissions Committee: James E. Simon
Correspondence and Information: Chairman, Graduate Admissions Committee, University of Illinois at Urbana-Champaign, 104 Architecture Building, Champaign, Illinois 61820

FACULTY

Professors: J. S. Baker, A. C. Bianchini, G. T. Clayton, P. H. Coy, W. L. Creese, G. D. Ding, W. Eng, W. L. Fash, G. Francescato, H. L. Hornbeak, S. T. Lanford, W. H. Lewis, C. B. Looker, C. T. Marfort, H. J. Miller, F. D. Moyer, E. L.

Murphree, A. Notaras, W. J. O'Connell, J. G. Replinger, I. Schousboe, J. H. Swing, R. L. Tavis, C. A. Winkelhake, H. C. Young

Associate Professors: R. L. Amico, D. E. Bergeson, V. V. Cafourek, R. A. Forrester, B. G. Freeman, B. L. Hutchings, J. F. Knight, L. A. Leffers, C. A. Moyer, J. W. Murdock, W. F. E. Preiser, J. E. Simon, R. L. Smith, H. C. White, D. Wickersheimer, R. L. Wright

Assistant Professors: J. R. Anderson, R. J. Betts, R. M. Brandon, E. H. Clay, S. V. Curcic, A. Kaha, H. C. Leung, R. T. Mooney, W. H. Russell, R. Seedorf, J. P. Warfield, E. Weidemann

Graduate Programs. The Department of Architecture offers graduate work leading to the degree of Master of Architecture for those entering with one of two basic qualifications. A two-year professional degree program, intended for those entering with a four year baccalaureate in architectural studies, emphasizes advanced study in architectural disciplines, study in depth in one optional area of concentration, and participation in creative research. Applicants who hold the Bachelor of Architecture are considered to have earned their first professional degree; therefore, a one-year Master of Architecture program is designed for their investigations in an optional area of concentration and participation in creative research.

Advanced study in architectural disciplines, building upon the fundamentals established in undergraduate study, comprises the initial phase of the two-year graduate program; it is a two-semester integrated sequence in architectural administration, construction, design, and structures. This work completes the common core of course work required of all candidates for the Master of Architecture professional degree.

Election of an optional area of concentration comprises the final phase of the graduate program and allows students to devote two semesters of work to a specific field of their choice. The fields available include courses both in the Department of Architecture and in other departments. The department offers optional areas of concentration in architectural administration and building technology, design, history, housing, structures, and urban design. Certain of these options afford the opportunity for further specialization in advocacy, behavioral cause and effect, criticism, industrialization, design methods and theory, preservation, interior architecture, and management. The department encourages a student with special interests to elect an optional concentration that includes course work offered in other departments. Further, individualized areas of concentration may also be pursued through an independent study option for which a research thesis is regularly required.

Participation in, or initiation of, creative research is encouraged in the optional areas of concentration. For those qualified, many opportunities currently exist in departmental and interdepartmental areas. These include unique research opportunities with the National Clearinghouse of Criminal Justice Planning and Architecture, a unit of the Department of Architecture, and the Office of Housing Research and Development, a unit of the Graduate College.

Admission. Admission with full standing requires the Bachelor of Science in Architectural Studies from the University of Illinois, or an undergraduate degree in architectural studies or architecture equivalent to that degree. A significantly higher grade point average than the 4.0 required by the Graduate College is normally necessary for admittance.

A student who has received an undergraduate degree in architectural studies or in architecture less than equivalent to the University of Illinois degree, but can establish equivalency through additional course work, may be admitted to qualified standing.

Master of Architecture. A master's degree candidate admitted with full or qualified standing to the two-year professional degree program must complete, with satisfactory grades, at least fifteen and one-half units of graduate work. The candidate must spend at least four semesters and earn at least one-half of the required units in residence. A candidate admitted with full standing may complete the master's program in two full-time academic years of study.

A master's degree candidate admitted to the one-year degree program must complete, with satisfactory grades, at least eight units of graduate work. The candidate must spend at least two semesters and earn at least one-half of the required units in residence. A candidate admitted with full standing may complete the master's program in one full-time academic year of study.

Admission with qualified standing, discharge of duties required for an assistantship, or other circumstances may extend the period of study.

Master of Architecture-Master of Business Administration. This double-master's program is offered by the Departments of Architecture and Business Administration. It aims at developing the management potential of qualified candidates in a rigorous curriculum emphasizing the theory and application of contemporary business administration principles in the comprehensive practice of architecture. The admissions and performance requirements of the respective departments must be separately satisfied. Those interested should consult Professor R. L. Tavis, M.Arch./M.B.A. Program Adviser.

ART AND DESIGN

(Including Art Education, Art History, Ceramics-Metalworking, Graphic Design, Industrial Design, Painting, Photography-Cinematography, Printmaking, and Sculpture)

Head of the Department: James R. Shipley
Associate Head: E. C. Wicks
Correspondence and Information: Associate Head, Department of Art and Design, University of Illinois at Urbana-Champaign, 140 Fine Arts Building, Champaign, Illinois 61820.

FACULTY

Professors: E. H. Betts, P. Fehl, F. Gallo, F. E. Gunter, K. M. Lansing, N. T. McFarland, A. Perkins, R. Perlman, E. C. Rae, D. M. Rowan, J. A. Savage, J. R. Shipley, A. R. Sinsabaugh, M. A. Sprague, R. W. Sterkel, E. C. Wicks, E. J. Zagorski, J. Ziff
Associate Professors: L. S. Bell, M. Franciscono, G. W. Hardiman, M. D. Hilson, K. Munakata, D. W. Pilcher, T. Zernich

Graduate Programs. The Department of Art and Design offers graduate work leading to the Master of Arts in Art Education and in Art History; the Master of Fine Arts in Art and Design with majors in Ceramics-Metalworking, Graphic Design, Industrial Design, Painting, Photography-Cinematography, Printmaking, and Sculpture; the Doctor of Education in Art Education; and the Doctor of Philosophy in Art History.

Admission. Applicants are expected to have completed an undergraduate program similar to that established at this University, with an emphasis, as indicated by the transcript or its equivalent, in experience and production in the area in which the applicant seeks to major in graduate study. Those intending to major in art education must have (or be eligible for) a teaching certificate in that field. Applicants for admission to the M.F.A. programs are required to submit a portfolio of examples of their creative work.

Admission to the Doctor of Education in Art Education program requires a master's degree in fine arts or art education, or the equivalent from an accredited institution as well as a minimum of two years of acceptable teaching experience. Final approval for admission is determined by the Committee on Graduate Study in Art Education.

Applicants for admission to the Doctor of Philosophy in Art History must hold a master's degree in art history, or its equivalent, from an accredited institution. Final approval for admission is determined by the Graduate Committee in History of Art and Architecture.

Master of Arts. A candidate for the A.M. in Art Education or Art History must spend at least two semesters or the equivalent in residence. Satisfactory completion of eight units of course work is necessary for the degree. A reading knowledge of French or German, successful completion of a comprehensive examination, and a thesis or scholarly paper are required in art history. No thesis is required in art education.

Master of Fine Arts. Satisfactory completion of sixteen units of course work is necessary for the degree. A candidate must spend a minimum of four semesters in residence. A thesis in the form of creative work in the major field of concentration and a written report are required.

Doctoral Degree Programs. Requirements include a minimum of sixteen units of course work beyond the master's degree, satisfactory performance on preliminary and final examinations, and a thesis which meets all Graduate College regulations covering preparation and submission. Students usually require from three to five years to complete the degree requirements.

ASIAN STUDIES

(Including Burmese, Chinese, Indonesian, Japanese, Korean, Persian, Sanskrit, and Thai)

Director: ROBERT B. CRAWFORD
Associate Director (South and West Asia): HAROLD A. GOULD
Graduate Supervisor: WILLIAM L. MACDONALD
Correspondence and Information: William L. MacDonald, Graduate Supervisor, Center for Asian Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: E. BRUNER, W. BUDDEMEIER, R. CRAWFORD, C. CUNNINGHAM, C. E. DAWN, L. EASTMAN, F. FLIEGEL, F. FOSTER, F GOTTHEIL, H. GOULD, N. JACOBS, B. KACHRU, Y. KACHRU, B. KARSH, C. KIM, F. K. LEHMAN, B. NETTL, A. PESHKIN, A. PERKINS, D. PLATH, A. RINGER, P SCHRAN, K. TAIRA, G. L. TIKKU, E. WOLFF, G. YU, L. ZGUSTA
Associate Professors: W. ARCHER, R. CHANG, C. CHENG, H. CHOLDIN, S. COHEN, S. DOUGLAS, K. GOULD, H. HOCK, T. HYMOWITZ, B. KLING, W. MACDONALD, S. MAKINO, K MUNAKATA, S. SATO, M. WAGNER, H. WECHSLER, M. WEINBAUM, M. WEINSTEIN
Assistant Professors: D. BISGAARD, S. BLUM, J. BRUKMAN, P. COLE, L. CRISSMAN, J. HART, R. JENNINGS, R. KRAUS, W. LAI, W. MAXWELL, C. MULHERN, J. PETERSON, J. PIERSON, M. SHORISH, K. SOUTHWOOD, R. VANNEMAN

Graduate Program. The Center for Asian Studies offers a two-year program of language and area courses leading to the Master of Arts in Asian Studies with regional concentrations in East Asia, Middle East, South Asia, and Southeast Asia. The program is a basic preparation in language and area training, both for those intending to proceed to the Ph.D. in a related field and for those preparing for careers not requiring the doctorate. The Center for Asian Studies also administers a graduate minor in Asian studies in cooperation with various departments, allowing a graduate student electing this minor to concentrate on East Asia, Middle East, South Asia, and Southeast Asia, or a combination of two or more of these areas.

Admission. Candidates for admission must meet at least the minimum standards established by the Graduate College for graduate study at the University of Illinois, but final selection is determined by a committee of center faculty. Applicants must specify one of the regional concentrations at the time of application. Although prior language and area training relating to the regional concentration is highly desirable,

it is not required for admission. Those entering without any prior training or experience, however, may be required to take without credit toward the degree such work as the adviser may deem necessary to make up any deficiencies.

Master of Arts. A candidate must complete nine units of work in area studies distributed among at least three disciplines and chosen from an accepted list of courses, demonstrate a reading knowledge of one language related to the candidate's regional concentration by satisfactory completion of an examination or appropriate course work, pass an examination covering the area studies taken while in residence, and complete two satisfactory research/seminar papers. No thesis is required.

Minors in Asian Studies. A candidate for a master's degree who elects Asian studies as a minor must earn at least two units of graduate credit in approved courses in at least two departments outside the major department.

A doctoral candidate who elects Asian studies as a minor must earn at least four units of graduate credit in approved courses in at least two departments outside the major department. Also, prior to the completion of course requirements for the degree, the doctoral candidate must complete satisfactorily an examination in an appropriate Asian language.

ASTRONOMY

Head of the Department: Icko Iben, Jr.
Correspondence and Information: Head, Department of Astronomy, University of Illinois at Urbana-Champaign, 103 Observatory, Urbana, Illinois 61801

FACULTY

Professors: W. D. Arnett, I. Iben, Jr., L. E. Snyder, G. W. Swenson, Jr., J. W. Truran, S. P. Wyatt, K. M. Yoss
Associate Professors: J. H. Cahn, J. R. Dickel, J. B. Kaler, E. C. Olson, W. D. Watson
Assistant Professors: R. M. Cruther, P. S. Hoover, M. R. Nelson

Graduate Programs. The Department of Astronomy offers graduate work leading to the Master of Science and Doctor of Philosophy.

Admission. Normal entrance requirements are a bachelor's degree in astronomy, physics, electrical engineering, physical chemistry, or mathematics, and a one-year course in descriptive astronomy. The award of financial assistance normally requires an average higher than 4.5.

Master of Science. Eight units of study in graduate courses are required. Ther are no thesis or foreign language requirements. The eight units of course work may be distributed as follows: all units taken in astronomy; or two units selected from approved courses in physics, two units from approved courses in mathematics and electrical engineering, with the remaining units selected from astronomy courses.

Doctor of Philosophy. A student continuing beyond the master's degree takes eight additional units of study and demonstrates a reading knowledge of two foreign languages. After passing both a written and an oral preliminary examination, the student then embarks upon an investigation which culminates in a doctoral dissertation and at least one paper suitable for publication in a recognized professional journal.

ATMOSPHERIC SCIENCES

Chairman of the Graduate College Committee on Atmospheric Science and Meteorology: R. O. Simmons

Correspondence and Information: Y. Ogura, Director, Laboratory for Atmospheric Research, 6-109 Coordinated Science Laboratory Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801

FACULTY

Professor: Y. Ogura
Associate Professors: M. A. Geller, M. K. Mak *
Assistant Professors: K. V. K. Beard, J. M. Lewis, W.-Y Sun, J. Walsh, R. Wilhelmson
Adjunct Professor: R. Semonin

Graduate Programs. A graduate program leading to the Master of Science and Doctor of Philosophy in Atmospheric Sciences is offered under the auspices of the Graduate College Committee on Atmospheric Science and Meteorology. These degree programs are designed for students interested in research and application in many aspects of atmospheric sciences. The areas of research include the observational and theoretical investigations of mesoscale atmospheric systems, the numerical modeling of clouds and cloud systems, the parameterization of the interaction of cloud ensembles with large-scale dynamics, dynamics of the atmosphere waves, the planetary boundary layer, dynamics of monsoonal circulation, dynamics of the upper atmosphere, dynamics of tropical circulations, dynamics of the sea breeze, polar meteorology, thermal convection and atmospheric turbulence, microphysics of cloud, and weather modification.

Admission. Applications for admission to this program must satisfy the general requirements for admission to the Graduate College. Previous training in the atmospheric sciences is not essential. It is strongly recommended, however, that students who intend to study for advanced degrees in the atmospheric sciences know the fundamentals of classical physics and applied mathematics.

Master of Science. A candidate for the Master of Science must complete eight units of credit. Three of the eight must be from courses numbered in the 400 series, and two of these three must be in the major field. Research for the Master's thesis, ATMOS 499, Section A, cannot be used to satisfy the latter requirements. Required courses for the degree are ATMOS 301, 302 and 401. Consequently, at least one other 400 level Atmospheric Science (ATMOS) course must be taken (excluding 499). A written thesis, involving from one to two units of credit, is a part of this requirement. Further information on exact degree requirements can be obtained through the Laboratory for Atmospheric Research.

Doctor of Philosophy. All candidates for the Ph.D. must satisfy the general requirements described on page 35 to 37 inclusive and are required to pass a qualifying examination on the basic principles of atmospheric science, a preliminary examination based on a written thesis proposal, and a final examination based on the completed thesis. Course requirements and these examinations are described in detail in a pamphlet which may be obtained from the Laboratory for Atmospheric Research. Experience has shown that this doctoral program may be completed by a full-time student in four years beyond the bachelor's degree.

BUSINESS ADMINISTRATION

Head of the Department: Kenneth P. Uhl
Correspondence and Information: Department of Business Administration, University of Illinois at Urbana-Champaign, 350 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: A. Andreasen, N. M. Bedford; R. L. Corley, P. M. Dauten, R. V. Evans, R. Ferber, D. M. Gardner, R. M. Hill, M. G. Jones, L. R. Pondy, W. Primeaux,

K. M. Rowland, H. M. Schoenfeld, J. N. Sheth, J. L. Simon, S. Sudman, W. E. Thomas, K. P. Uhl, W. Zangwill

Associate Professors: A. J. Arnould, R. L. Black, H. Hinomoto, D. Roberts, G. Salancik, F. W. Winter

Assistant Professors: R. Atkinson, R. W. Belk, C. Hedrick, M. London, H. W. Melton, J. K. Murnighan, G. R. Oldham, W. Rom, A. E. Roth, D. Whetten

Graduate Programs. The Department of Business Administration offers graduate programs leading to the degrees of Master of Business Administration, Master of Science in Business Administration, and Doctor of Philosophy in Business Administration. The department also offers, in cooperation with other departments and colleges, a variety of interdisciplinary programs leading to such combined degrees as the Master of Business Administration and Juris Doctor.

Admission. The minimum admission requirement is a grade-point average of 4.0 on the last two years of course work for either master's degree, 4.25 for the doctoral degree, and an acceptable score (550) on the Graduate Management Admission Test, administered by the Educational Testing Service, Princeton, New Jersey 08540. Applicants with extenuating circumstances should contact the Director of Graduate Studies in Business Administration. Persons seeking admission should have completed one year of college-level courses in calculus or be prepared to remove this deficiency immediately upon entering the program. In general, admission is based on a person's (1) previous academic accomplishment; (2) demonstrated potential as indicated by performance on the Graduate Management Admission Test; (3) statement of educational goals; and (4) letters of recommendation from professors, supervisors, or colleagues.

Master of Business Administration. The Master of Business Administration is designed to meet the educational needs of persons preparing for administrative positions. It encourages the development and application of fundamental concepts and methods in the quantitative, social, and behavioral sciences to problems in administrative decision making. Superior students without a background in business can achieve a rigorous educational background in administration within two years or less by completing sixteen units of course work. Persons with a background in business usually may graduate with as few as twelve units of course work. The program may be started at the beginning of any semester, including the summer term.

Three areas of study in quantitative methods, behavioral science, and economics make up the required program core and four courses covering marketing, introduction to production, financial management, and managerial accounting and control constitute the functional areas. The core courses introduce and integrate the contributions of the quantitative, social, and behavioral sciences to the functional areas. Two additional courses, in law and business policy and in business policy and planning, provide an overview of the legal environment and policy and planning. Four elective courses complete the program.

Master of Science in Business Administration. The Master of Science in Business Administration program offers a ten- to twelve-unit master's program for persons with an undergraduate education in business who desire additional training in a specialized area. The focus is on preparation for advanced study in the doctoral program or for a research-oriented position. The course work can usually be completed in one to one and one-half years.

The program core for this degree is the same as for the Master of Business Administration. Four courses constitute the major area of specialization. The areas available include management science, organizational behavior, management information systems, marketing, international business operations, and administration. Two courses constitute a minor area. They can be two independent research courses, or can be chosen from the list of majors or from related areas outside the department or college. In place of the two courses, a thesis may be prepared.

Doctor of Philosophy in Business Administration. This program offers an in-depth education in teaching and research in selected areas of business and administration.

The Doctor of Philosophy in Business Administration identifies the recipient as a professional who is concerned with the purposeful search for knowledge. Doctoral students can specialize in management science, marketing, organizational behavior, management information systems, production, administration, and other specialized areas. The program is flexible and adaptable to individual needs; it provides a creative learning environment in which students assess their knowledge and skills in consultation with faculty members and design programs which will fulfill their unique needs and enable them to effectively pursue their personal goals.

Each student's program will entail sufficient study and preparation to achieve the following: (1) Competence in behavioral science, operations research, research methodology, and statistics. These topics constitute the *core* of the program. (2) An in-depth expertise in a *major area.* (3) Expertise in at least one area in addition to the chosen major area. The minor areas may be selected from within or from outside the department. (4) Teaching competence. (5) Research or problem solving competence.

For persons entering the program from an undergraduate program, the minimum requirements are sixteen course units (one unit equals four semester hours or six quarter hours) and eight dissertation units. Persons entering with a master's degree in business generally will need a minimum of eight course units and eight dissertation units.

Competency is determined by a series of comprehensive written and/or oral examinations. Following successful completion of all course work and comprehensive examinations, the student formally proposes a dissertation topic at a public colloquium. The final program requirement is the successful oral defense of the dissertation. This program usually is completed in three to four years.

Master of Business Administration and Juris Doctor Program. This program, leading to the M.B.A. and J.D. degrees in four years, is designed to afford persons the opportunity to obtain training for careers in which administration and law overlap to a considerable extent. To enter the program, a person must apply separately and be admitted to the College of Law as well as the Department of Business Administration of the College of Commerce and Business Administration. The policies of each college with respect to degree requirements, grades, examinations, and other academic requirements for graduation are applicable.

During his first two years, the student takes the first-year law curriculum in one year and the first-year business administration curriculum in the other. The student takes courses in both colleges his third and fourth years.

As a minimum program, a student would have to take seventy-four hours of law courses and twelve units (or forty-eight semester hours) of business administration courses.

CERAMIC ENGINEERING

(Including Ceramics)

Head of Department: A. L. Friedberg

Correspondence and Information: A. L. Friedberg, Head, Department of Ceramic Engineering, University of Illinois at Urbana-Champaign, 204 Ceramics Building, Urbana, Illinois 61801

FACULTY

Professors: R. L. Berger, C. G. Bergeron, S. D. Brown, R. L. Cook, A. L. Friedberg, J. A. Nelson, W. S. Williams

Associate Professors: R. C. Buchanan, D. R. O'Boyle, T. A. Willmore, G. P. Wirtz

Assistant Professors: G. H. Kenner, D. A. Payne

Graduate Programs. The Department of Ceramic Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Ceramics and the Master of Science and Doctor of Philosophy in Ceramic Engineering. The program in ceramic engineering involves instruction and research related to applied science and engineering concerning ceramic materials. Candidates in this area of concentration are usually those who have completed an undergraduate degree in engineering. The prerequisite for graduate study is proficiency in the undergraduate courses required for the Bachelor of Science in Ceramic Engineering at the University of Illinois, or acceptable equivalents. Ceramics encompasses a program more concerned with basic materials science, and candidates may come from nonengineering disciplines such as chemistry, physics, or geology.

Master of Science. The candidate for the Master of Science in Ceramics or Ceramic Engineering must complete a minimum of eight units of graduate work, including a thesis.

Doctor of Philosophy. Candidates for the Doctor of Philosophy in Ceramics or in Ceramic Engineering are required to complete first the master's thesis or give equivalent evidence of research experience. They must also pass the departmental qualifying examination. There is no foreign language requirement. Minor requirements are satisfied by courses selected in chemistry, physics, mathematics, geology, or other engineering disciplines.

Students majoring in chemistry, physics, engineering, and in certain other departments may take sole or second minors in ceramics or ceramic engineering.

CHEMICAL PHYSICS

Head of the Department of Chemistry: H. S. Gutowsky
Head of the Department of Physics: Ralph O. Simmons
Correspondence and Information: Students with undergraduate degrees in chemistry should direct inquiries and applications to the Head of the Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, Urbana, Illinois 61801; students with undergraduate degrees in physics should direct inquiries and applications to the Head of the Department of Physics, University of Illinois at Urbana-Champaign, 215 Physics Building, Urbana, Illinois 61801

Graduate Program. Fundamental research on many properties of molecular and solid state systems is based on an understanding of chemistry, physics, and mathematics that can best be obtained by training in more than one department of the University. A program leading to the Doctor of Philosophy in Chemical Physics makes it possible for students to gain the necessary background and perform original research in this interdisciplinary field of science. Students may make use of the facilities available in both the School of Chemical Sciences and the Department of Physics.

Admission. Applicants to be considered for admission should have undergraduate degrees in chemistry or physics, and a strong background in the major field of chemistry or physics, with more than the usual training in the other area. Those who received their degrees in physics should have the equivalent of one semester each of organic and inorganic chemistry and one year of physical chemistry. Those who received their degrees in chemistry should have the equivalent of one semester each of intermediate mechanics and intermediate electricity and magnetism. One year of mathematics beyond calculus is recommended. Any deficiencies should be removed during the first year of study. Students may apply for fellowships and assistantships from either the Department of Chemistry or the Department of Physics.

Doctor of Philosophy. In addition to taking a series of appropriate courses, determined mainly by their research interests, students must pass either the qualifying examination in the Department of Physics or the set of cumulative examinations given

in physical chemistry. A knowledge of basic quantum mechanics and statistical mechanics must also be demonstrated (for example, by passing the final examination in appropriate courses). In addition, students must pass an oral preliminary exam concerned with their preparation for doing research. Research for the dissertation is performed under the direction of staff members who are currently active in chemical physics. Many of these staff members are affiliated with the Materials Research Laboratory (MRL). MRL is a multidisciplinary facility shared by staff and students from physics, chemistry, metallurgy, ceramic engineering, electrical engineering, and other related departments, who have common interests in materials science. It promotes interdisciplinary interactions, fresh viewpoints, and a creative and stimulating environment. (See page 16).

CHEMICAL SCIENCES

(Including Biochemistry, Chemical Engineering, and Chemistry)

Director of the School of Chemical Sciences: H. S. Gutowsky
Correspondence and Information: Director of the School of Chemical Sciences, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, Urbana, Illinois 61801

The School of Chemical Sciences includes the Departments of Biochemistry, Chemical Engineering, and Chemistry. Study programs leading to the degrees of Master of Science and Doctor of Philosophy are offered in each of the departments as described in the following sections. The school structure is designed to meet the differing needs of the three departments, and yet retain the advantages of a common approach to overlapping concerns. Support for graduate training is available in the form of assistantships, traineeships, and fellowships. Prospective students may obtain application forms and information relevant to their interests from the head of the appropriate department or from the director of the School of Chemical Sciences.

Biochemistry

Head of the Department: Lowell P. Hager
Correspondence and Information: Head, Department of Biochemistry, University of Illinois at Urbana-Champaign, 415 Roger Adams Laboratory, Urbana, Illinois 61801

FACULTY

Professors: H. E. Conrad, I. C. Gunsalus, L. P. Hager, N. J. Leonard, R. F. Nystrom, G. Weber
Associate Professors: J. M. Clark, Jr., R. L. Switzer, O. C. Uhlenbeck
Assistant Professors: T. O. Baldwin, R. B. Gennis, M. Glaser, R. I. Gumport, A. Jonas, W. F. Mangel, G. W. Ordal, J. L. Robinson, P. G. Schmidt, D. J. Shapiro, D. R. Storm

Graduate Programs. The Department of Biochemistry offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees.

Admission. Applicants are expected to have completed a full year each of organic and physical chemistry at the undergraduate level and to have taken the equivalent of a strong minor program in the life sciences area. Students whose undergraduate training is deficient in one or more of these areas can be admitted with the provision that the deficiencies will be removed in an early phase of their graduate training. Financial aid is available to virtually all students who are accepted as degree candidates in the Ph.D. program. This aid is available in the

form of National Institutes of Health traineeships, fellowships, and teaching and research assistantships.

Master of Science. The Master of Science in Biochemistry may be completed with or without a thesis. A course work master's degree requires a minimum to two full-time semesters and involves eight units of formal lecture and laboratory course work. A Master of Science degree with thesis usually requires a minimum of three semesters work, in which three of the eight required units may involve thesis research.

Doctor of Philosophy. Qualification for the Ph.D. program in biochemistry involves passing a research qualifying exam within the first eighteen months of residency and requires the successful completion of a series of written cumulative exams. Four and one-half units of biochemistry course work and three to four units of course work outside of biochemistry are required. Proficiency will be required in one modern foreign language (German, French, or Russian). Proficiency may be demonstrated by successful completion of a reading examination in the chosen language or by presentation of two years of undergraduate credit in one of these languages. A thesis based on original research must be presented to a review committee at least two weeks prior to the final examination. The final examination is limited to a defense of the thesis research topic. The Ph.D. degree program usually takes four to five years for completion. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Chemical Engineering

Head of the Department: J. W. Westwater

Correspondence and Information: Head, Department of Chemical Engineering, University of Illinois at Urbana-Champaign, 113 Roger Adams Laboratory, Urbana, Illinois 61801

FACULTY

Professors: H. G. Drickamer, C. A. Eckert, T. J. Hanratty, R. A. Schmitz, J. W. Westwater

Associate Professors: R. C. Alkire, R. L. Sani

Graduate Programs. The Department of Chemical Engineering offers graduate work leading to the Master of Science and the Doctor of Philosophy. Those interested should write to the address above for application materials and a departmental brochure which gives greater detail on programs, offerings, admission, degree requirements, and financial aid.

Admission. Candidates for advanced degrees in chemical engineering should have a background in chemistry and chemical engineering comparable to the training offered in the undergraduate chemical engineering curriculum at the University of Illinois. Students whose prior training is deficient in one or more basic areas of chemistry or chemical engineering will be admitted with deficiencies to be removed to the extent prescribed by their advisers.

Master of Science. Requirements for the Master of Science in Chemical Engineering include eight units of graduate credit and a thesis. At least five of these units must be in courses other than thesis, and they must include at least two graduate-level chemical engineering courses.

Doctor of Philosophy. Requirements include twenty-four units of graduate credit, satisfactory performance on qualifying and certification examinations, and a thesis. The credit requirement includes a minimum of four graduate-level courses in

chemical engineering and a coherent program of at least four courses in one or two other departments. The qualifying examination is a written test normally taken after one year of study. The certification examination is an individual oral examination taken after the student has satisfied the course requirements. It focuses on the student's proposed thesis research.

Chemistry

Head of the Department: H. S. GUTOWSKY
Associate Head: J. P. HUMMEL
Correspondence and Information: Head, Department of Chemistry, University of Illinois at Urbana-Champaign, 108 Noyes Laboratory, Urbana, Illinois 61801

FACULTY

Professors: D. E. APPLEQUIST, P. BEAK, T. L. BROWN, D. Y. CURTIN, R. S. DRAGO, H. G. DRICKAMER, W. H. FLYGARE, H. S. GUTOWSKY, G. P. HAIGHT, JR., J. P. HUMMEL, J. JONAS, N. J. LEONARD, H. V. MALMSTADT, R. A. MARCUS, J. C. MARTIN, I. C. PAUL, K. L. RINEHART, S. G. SMITH, H. R. SNYDER, G. D. STUCKY, P. E. YANKWICH
Associate Professors: R. L. BELFORD, D. CHANDLER, R. M. COATES, C. A. EVANS, JR., L. R. FAULKNER, D. N. HENDRICKSON, J. A. KATZENELLENBOGEN, W. H. PIRKLE, D. H. SECREST, O. G. UHLENBECK, J. T. YARDLEY
Assistant Professors: E. K. BAREFIELD, J. W. BIRKS, R. B. GENNIS, K. J. KAUFMANN, J. D. MCDONALD, T. A. NIEMAN, E. OLDFIELD, P. G. SCHMIDT, G. B. SCHUSTER, J. R. SHAPLEY

Graduate Programs. The degrees offered in chemistry are Master of Arts or Master of Science in Chemistry, Master of Science in the Teaching of Chemistry, and Doctor of Philosophy in Chemistry. Attention is also called to a joint program leading to the Doctor of Philosophy in Chemical Physics (see page 62) and to the programs in Biophysics (see page 107) and in Biophysical Chemistry (see page 65).

Admission. Students who have fulfilled the usual undergraduate course requirements, including at least twenty-five properly distributed semester hours in chemistry, may be considered for admission to the Graduate College in any of the programs offered by the Department of Chemistry. Students who have completed graduate work in chemistry at another institution may be considered for admission if they have averages of 4.0 in both undergraduate and graduate work, or if they have earned a 4.25 average in at least eight units or a full year of graduate work at an accredited institution. Students applying for admission to the program in the Teaching of Chemistry are expected to have a valid secondary teaching certificate or to make arrangements for obtaining one before completing the requirements for the degree.

The Teaching of Chemistry Program. Candidates for the Master of Science in the Teaching of Chemistry must earn four units of credit in chemistry, two units in education, and two units of electives in either education or physical science. The two units in education consist of courses in the history and philosophy of education and educational psychology. The courses in chemistry and the electives, which must normally give graduate credit, must be selected with the approval of the adviser. No thesis is required. Questions concerning the Teaching of Chemistry Program should be addressed to Professor D. H. Secrest, 155 Noyes Laboratory.

Master's Programs in Chemistry. The programs leading to degrees of Master of Arts or Master of Science in Chemistry are designed to be completed in one year of full-time study by students entering without deficiencies. A thesis is optional. If a thesis is elected, five units of formal courses are required, three of which must be 400-level courses. Of these three, two must be in chemistry. If a thesis is not elected, an additional three units of formal courses are required.

Doctor of Philosophy. Doctoral programs are offered in a wide range of specialties including the traditional areas of analytical, inorganic, organic, and physical chemistry. Students usually require from three to five years to complete the requirements. Besides completing formal course work, the students are required to pass a series of written cumulative exams, demonstrate a reading knowledge of a foreign language (except in physical and biophysical chemistry), pass an oral preliminary exam on research preparation, and submit a thesis on original research which is defended at a final oral exam. The formal courses requirements involve two and one-half units of 400-level courses in the major area of interest and three units in allied areas or fields. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Program in Biophysical Chemistry. The Department of Chemistry offers an area of specialization in biophysical chemistry. The program is flexible and provides the student with basic training in physical chemistry, physical biochemistry, and biology. Students electing this area should have a solid background in physics and mathematics. Details of the curriculum are decided individually. Interested students should direct inquiries and applications to the head of the Department of Chemistry.

CIVIL ENGINEERING

(Including Environmental Engineering in Civil Engineering)

Head of the Department: C. P. Siess

Correspondence and Information: Head, Department of Civil Engineering, University of Illinis at Urbana-Champaign, 1114 Civil Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: W. C. Ackermann, A. H-S. Ang, J. E. Baerwald, E. J. Barenberg, R. L. Berger, J. W. Briscoe, V. T. Chow, E. J. Cording, M. T. Davisson, D. C. Drucker, R. S. Engelbrecht, R. A. Eubanks, B. B. Ewing, W. L. Gamble, G. R. Gurfinkel, W. J. Hall, J. D. Haltiwanger, W. W. Hay, A. J. Hendron, M. Herrin, E. R. Holley, H. O. Ireland, H. M. Karara, C. E. Kesler, N. Khachaturian, R. W. Larimore, T. E. Larson, Jon C. Liebman, W. P. Lowry, J. W. Melin, R. J. Mosborg, W. H. Munse, J. P. Murtha, N. M. Newmark, R. B. Peck, J. T. Pfeffer, A. R. Robinson, W. C. Schnobrich, L. R. Shaffer, C. P. Siess, G. K. Sinnamon, M. A. Sozen, J. E. Stallmeyer, M. R. Thompson, R. N. Wright

Associate Professors: L. T. Boyer, E. S. K. Chain, B. J. Dempsey, R. E. Hever, F. V. Lawrence, L. A. Lopez, W. H. C. Maxwell, J. McDonald, G. Mesri, D. A. W. Pecknold, V. L. Snoeyink, J. J. Stukel, W. Tang, W. H. Walker, H. G. Wenzel, K. W. Wong, B. C. Yen, J. F. Young

Assistant Professors: E. D. Brill, M. I. Darter, L. J. Forney, J. Ghaboussi, O. E. Lev, Judith S. Liebman, S. L. Paul, N. K. Saxena, M. J. Semmens, Y. K. Wen.

Graduate Programs. The Department of Civil Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Civil Engineering and in Environmental Engineering in Civil Engineering.

Emphasis is placed upon advanced study and participation in creative research. Graduate study and research can be pursued in the following general fields: air pollution, computer-aided design, construction management, structural analysis and design, foundations, earthquake engineering, environmental engineering in civil engineering, geodesy, highway and materials, hydraulics and

hydrology, liquid-solid waste management, materials engineering, nuclear shielding, photogrammetry, soil and rock mechanics, structural mechanics. probability and stochastic processes, systems engineering, transportation, and water resources. Interdisciplinary programs with other departments or colleges can also be arranged.

Admission. Students are admitted with full standing if they hold undergraduate degrees substantially equivalent to those of the University of Illinois, provided the applicant's preparation is appropriate to advanced study in his chosen major field. For additional information, see the department pamphlet "Graduate Study and Research in Civil Engineering and in Environmental Engineering in Civil Engineering."

Master of Science. A master's program may be completed in one full-time academic year of study. A candidate for the master's degree must complete at least eight units. Three of the eight units must be in courses numbered in the 400 series, and two of these three must be taken for grades in the major field: A total of at least four units must be in the major field. There are no specific course requirements; individual programs are developed by the student in consultation with his academic adviser. At least one-half of the minimum units required for the degree must be in courses meeting on the Urbana-Champaign Campus, or in courses meeting in other locations approved by the Graduate College for residence credit for the degree sought. Under certain conditions, a student holding a half-time assistantship for an academic year and a summer can obtain a master's degree in this period of time.

Doctor of Philosophy. The degree of Doctor of Philosophy, primarily a research degree, requires from three to five years of graduate study beyond the bachelor's degree. In accordance with Graduate College regulations, two of the three stages must be completed in residence. The major area of specialization encompasses courses and research which are closely related but the courses need not necessarily be offered by a single major department. There is no department-wide foreign language requirement. However, the faculties of some areas of specialization may require foreign language proficiency, if essential to the conduct of research in that area. The candidate must demonstrate a capacity for independent research by preparing an original thesis on a topic within the major field of study, must meet the qualifying requirements or examination in the area of specialization, and must pass both preliminary and final examinations.

CLASSICS

(Including Classical Greek, Classical Philology, and Latin)

Head of the Department: Miroslav Marcovich
Correspondence and Information: Department of the Classics, University of Illinois at Urbana-Champaign, 4072 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. J. Bateman, M. Marcovich, M. Naoumides, R. P. Oliver, W. R. Schoedel, L. Wallach, L. Zgusta
Associate Professors: G. M. Browne, H. Jacobson, J. K. Newman, V. K. Robbins, R. T. Scanlan
Assistant Professors: D. F. Bright, J. Dengate, D. Sansone, D. Sutton

Graduate Programs. The Department of the Classics offers graduate work leading to the Master of Arts in Classics, Latin, Greek, and in the Teaching of Latin, and Doctor of Philosophy in Classical Philology. Although the graduate program is designed to educate students in breadth and depth in classical studies in the widest sense, students may concentrate at different stages upon Greek and Latin language and literature (including Greek and Latin patristics, mediaeval Latin, and Neo-Latin); classical archaeology, or, in conjunction with the appropriate department, comparative literature, ancient history, ancient philosophy, and classical linguistics. A brochure describing the current "Regulations Governing Candidates for Advanced Degrees" and special programs for prospective secondary school or junior college teachers may be obtained from the department office.

Admissions. Applicants for admission to graduate study in the classics must ordinarily present at least twenty hours of college-level work in either Greek or Latin. Previous study of history, philosophy, and linguistics is especially recommended.

Master of Arts. The Master of Arts may be taken in Classics, Greek, Latin, or in the Teaching of Latin. Candidates for this degree must complete eight units of course work, of which at least four units should be in the major subject (Greek or Latin); the remaining four units may be in courses offered in Classics or related subjects in other departments. Of the four units of credit in the major subject at least three are to be selected from 400-level courses (exclusive of Latin 400 and 401). A sight-translation examination in the major language (either Greek or Latin) and either a master's thesis or an extended essay are required for the degree. The thesis has the value of two units, the essay that of one unit. The candidates for the M.A. in the Teaching of Latin are exempted from a thesis or essay. The form of the examination is determined by the chairman of the candidate's M.A. committee. See page 35 for special requirements in the fifth-year teaching program.

Doctor of Philosophy. The Doctor of Philosophy is offered in Classical Philology, which requires advanced work in both Greek and Latin. Candidates for the Ph.D. program are accepted upon the completion of the master's and the passing of a qualifying examination, which includes sight translations in one of the two major languages, Greek or Latin. Once admitted they are expected to take at least sixteen units. These include eight units of course work, with at least four in the major language, Greek or Latin, and at least two in the other. Five units are to be taken on the 400 level. Students may take a minor of two units in a related field. The department requires a reading knowledge in two tool languages, usually French and German; the knowledge in one of these is to be demonstrated at the end of the first year, and in the other by the end of the second year of residence. The dissertation counts as eight units. Work on the dissertation begins upon the passing of the preliminary examination.

COMMUNICATIONS

Dean of the College of Communications: THEODORE PETERSON
Chairman of the Graduate Committee in Communications: JAMES W. CAREY
Correspondence and Information: Chairman, Graduate Committee in Communications University of Illinois at Urbana-Champaign, 222 B. Armory, Champaign, Illinois 61820

FACULTY

Professors: A. M. BARBAN, J. W. CAREY, N. DENZIN, S. W. DUNN, M. E. FISHBEIN, J. W. JENSEN, H. MACLAY, R. MERRITT, H. L. MUELLER, C. E. OSGOOD, T. PETERSON, J. H. SCHACHT, R. J. SIMON, N. WEDDING, N. WIGGINS

Associate Professors: W. K. Archer, W. Brewer, T. Guback, J. G. Delia, K. Rotzoll
Assistant Professors: C. Christians, J. Brukman, E. Douglass, J. E. Erickson, J. Haefner, A. L. Kreiling, D. P. Mullally

Graduate Program. The program for the Doctor of Philosophy in Communications is administered by the Institute of Communications Research in the College of Communications. It provides a core program in communications and permits advanced specialization in several areas: process, content, and effects of the mass media, including their political, social, and economic aspects; popular culture; persuasion and attitude change; advertising; interpersonal communication; and psycholinguistics. The program applies the methods and disciplines of the social sciences, supported by the humanities, fine and applied arts, and natural sciences, to the basic problems of human communications. It is intended for students who plan careers in teaching such communication subjects as journalism, radio-television, and psycholinguistics; scholarly research on the development, control, and ethics of the mass media; research on public opinion measurement, advertising, communication effects, psycholinguistics, and semantics; and executive jobs in government and industry requiring breadth, perspective, and a scholarly background.

Doctor of Philosophy. Students working toward a Ph.D. normally require from three to five years to complete their work. A full-time student entering the program directly upon receiving a bachelor's degree should expect to take two years of course work and a minimum of one additional year for the preparation of a dissertation. Full-time students entering with a master's degree should expect to take a minimum of one year of course work prior to embarking on the dissertation. A master's degree in communications is not offered. Students desiring to complete a master's degree should consider enrolling in the Departments of Journalism, Radio and Television, or Advertising, or in one of the several departments in the social sciences. Doctoral students must pass preliminary examinations covering course work and declared specialties and a final examination covering the dissertation.

COMPARATIVE LITERATURE

Director of the Graduate Program: François Jost
Correspondence and Information: Director of Graduate Studies, Program in Comparative Literature, University of Illinois at Urbana-Champaign, 2070 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: A. O. Aldridge, B. Benstock, W. Hollerer, F. Jost, H. Knust, R. Montano, G. Tikku

Graduate Programs. The program leading to the degrees of Master of Arts and Doctor of Philosophy in Comparative Literature is designed to make possible a systematic study of subjects and problems common to several literatures. Its purpose is to enable students who have linguistic competence and preparation to explore the theory of literature and criticism; the interrelations of several literatures; the main currents, periods, and movements in literary history; the development of literary themes and types; and relations between literature and other media. This interdepartmental program is assisted by an advisory committee consisting of representatives of the departments of modern languages and literatures and classics. The student's program of study is supervised by an adviser from the Program in Comparative Literature. The journal *Comparative Literature Studies* is sponsored by the program.

Admission. A student entering the program should have an undergraduate major in English, classics, or foreign languages. Majors in history and philosophy may also be accepted with the special consent of the adviser.

Master of Arts. The candidate must demonstrate a competency in at least two foreign languages as well as in English. Some knowledge of Latin (or Greek) is highly recommended; Latin is necessary for students planning to specialize in the Middle Ages, the Renaissance, or neoclassicism. Competency in the languages offered is measured either by the successful completion of one advanced course in the literature of each of the languages chosen or by passing an examination administered by the Program in Comparative Literature with the assistance of an expert in the language concerned. This choice is intended to provide for exotic languages which may not be taught in regular departments.

The candidate must also acquire eight units of credit including a course in theory of literature and two other seminars in comparative literature taught by members of the comparative literature faculty. The other five units must be taken in two or three national literatures in a distribution approved by the adviser; at least five of the eight units must be taken in courses at the 400 level. The candidate must also pass a written examination, based on a reading list, which is designed to test knowledge of literary history as well as ability to interpret a literary or critical text. A thesis is optional.

Doctor of Philosophy. A candidate for the Doctor of Philosophy must fulfill the general requirements of the Graduate College including those specified above for the master's degree. Competency must be demonstrated in at least three foreign languages as well as in English. These three languages must coincide with those vital to the student's dissertation and area of specialization. The candidate must choose at least four units of work from comparative literature seminars taught by members of the comparative literature faculty. Four additional units of work at the 400 level must be taken in courses regularly offered by the literature departments; among these, courses crosslisted with comparative literature are especially recommended. The candidate is responsible for a knowledge of the history of the literature in one modern language. The student must also select a period of major interest, and be responsible for a knowledge of two other literatures in this period, which are considered as minors. The periods may be mediaeval, Renaissance, neoclassical and Enlightenment, or modern (nineteenth and twentieth centuries). A preliminary examination, a four-part written examination based on his individual program, plus an oral examination must be passed and the candidate must present a dissertation embracing several national literatures.

COMPUTER SCIENCE

Head of the Department: J. N. Snyder
Chairman of the Committee on Fellowships, Assistantships and Admissions: W. J. Kubitz
Correspondence and Information: J. N. Snyder, Head of the Department of Computer Science, University of Illinois at Urbana-Champaign, 252 Digital Computer Laboratory, Urbana, Illinois 61801

FACULTY

Professors: C. W. Gear, D. Kuck, C. L. Liu, S. Muroga, T. A. Murrell, J. Nievergelt, W. J. Poppelbaum, S. R. Ray, J. E. Robertson, D. L. Slotnick, J. N. Snyder
Associate Professors: M. Faiman, H. G. Friedman, Jr., W. J. Kubitz, J. W.-S. Liu, R. S. Michalski, E. M. Reingold, A. H. Sameh, P. E. Saylor
Assistant Professors: W. J. Hansen, G. R. Kampen, D. H. Lawrie, M. D. Mickunas, R. G. Montanelli, Jr., D. A. Plaisted, A. H. Sherman, R. D. Skeel, D. S. Watanabe, T. R. Wilcox

Graduate Programs. The Department of Computer Science offers graduate work leading to the degrees of Master of Science in Computer Science (M.S.), Doctor of Philosophy in Computer Science (Ph.D.), Master of Science in the Teaching of Com-

puter Science (MSTCS), and a professional degree, Master of Computer Science (MCS). Areas of specialization: analysis of algorithms and theory of computation, combinatorics, computer aided instruction, computer applications in physical and social sciences, computer networks, computer organization, digital computer arithmetic, digital systems design, display systems, hardware systems design, information retrieval, programming languages, numerical analysis, pattern recognition, software systems, and switching theory.

RESEARCH DEGREES (M.S. AND PH.D.)

Master of Science in Computer Science. The student must complete eight units and write a master's thesis. Of these units, a minimum of four must be graduate courses in computer science. Three courses must be taken at the 400 level, and at least two of these must be in computer science. One unit of C. S. 499, Thesis Research, may be used as one of these 400-level computer science courses. The student must maintain a minimum grade-point average of 4.0 for all graduate and computer science courses. In addition, the student must satisfy the Graduate College residency and time limit requirements and successfully pass the general examination (described below).

General Examination. Every M.S. and Ph.D. student is expected to take this examination at the beginning of the first semester of graduate study in the department. The examination covers five basic areas: computer hardware, computer logic design, computer software, numerical analysis, and theory of computation. The student must pass in logic design, software, and any two of the other three areas and must retake the examination in any areas failed until four have been passed. A student may take the entire examination or a portion thereof up to a maximum of three consecutive offerings. A student will not be allowed to register in the department after failing to complete this examination by the end of the third semester after enrollment. A syllabus for this examination has been prepared to aid in study and preparation. It is available as DCS Report Number UIUCDCS-R-74-645.

Ph.D. in Computer Science. The student must declare a major field of study in computer science, and an approved four unit minor outside of computer science, or two minors of two units each.

The student must first satisfy the general examination (described above) and the eight-unit requirement for the Master of Science in Computer Science as described above but need not write an M.S. thesis if an M.S. degree is not sought. The student must then successfully complete eight units of graduate course work beyond the requirements for the M.S. degree and perform satisfactory research culminating in a Ph.D. thesis. Six of the total sixteen course work units must be graduate computer science courses. The student must also pass the qualifying examination, the preliminary examination, the final examination as described below, and the Graduate College residency and time limit requirements. For degree certification, a 4.0 grade-point average must be maintained for all graduate and computer science courses.

Qualifying Examination. This oral examination must be passed by each Ph.D. student in computer science prior to beginning Ph.D. thesis research. The student must take the examination in one of the five general areas: computer organization and logic design, hardware, numerical analysis, software, and theory of computation.

The student's performance on this oral examination and his previous record, including graduate courses and general examination performance, will be considered in deciding whether he passes the qualifying examination.

The qualifying examination may not be taken until the general examination has been passed. Students entering the department with fewer than eight units must take the qualifying examination no later than their fourth semester. Students entering the department with eight or more units must take this examination no later than their third semester.

Preliminary Examination. The purpose of this examination is to ensure that the chosen thesis topic is reasonable and that the student seems capable of carrying out the thesis research. It is an oral examination administered by five faculty members, including the thesis adviser.

Final Examination. This examination must be passed by each Ph.D. student before receiving the Ph.D. degree. The purpose of the examination is to determine that the thesis research has been carried to a point where the degree is warranted, and to ensure that the research results have been adequately recorded. The student's preliminary examination committee administers this oral examination.

Language. A reading knowledge of one foreign language must be demonstrated. Students may satisfy reading proficiency by either taking a direct examination administered by the language department, receiving an acceptable score on the Educational Testing Service test in the language, obtaining grades of A or B in the language reading course for graduate students, submitting evidence of having passed a two-year undergraduate sequence in the language, or submitting evidence of having passed a four-year high school sequence in the language. Any language for which appropriate courses or examinations exist at this University are acceptable. A student whose native language is not English will be regarded as having satisfied the foreign language requirement by passing the standard English language requirement which is necessary for admission to the Graduate College.

Admission to the M.S. and Ph.D. Programs. The Department of Computer Science will consider an application for admission to the M.S./Ph.D. program if the applicant: submits the results of the Verbal and Quantitative Graduate Record Examination, holds a baccalaureate or higher degree equivalent to that granted by the University of Illinois, has taken twenty semester hours of computer science, electrical engineering, mathematics, or physics, and has had any three of the following five courses (or their equivalent):

CS 221 Machine Language and System Programming
CS 257 Introduction to Numerical Analysis
CS 264 Introduction to the Theory of Digital Machines
CS 273 Introduction to the Theory of Computation
CS 281 Introduction to Computer Hardware

In case of deficiencies (either departmental or Graduate College), a student may still be admitted for graduate work, but must remove these deficiencies in the first year.

PROFESSIONAL DEGREES (MCS AND MSTCS)

Master of Computer Science. The Master of Computer Science program is designed to meet the educational needs of students who enter without an extensive computer science background but expect to be involved with computers in their professional careers. It is a professional program which would not ordinarily lead to the doctorate. The purpose of MCS program is to develop professionals who can apply fundamental concepts and methods of computer science to fields where computers are of importance.

The program requires sixteen courses. Of these, thirteen are normally courses which carry graduate credit; the other three are basic courses (required for most entering students) constituting nine hours of credit. These sixteen courses include four units of individual study and a core of twelve courses. The student carries out an individual study program under the supervision of a faculty adviser and prepares formal documentation of the results. Candidates with a strong background in both science and computer applications may graduate with a minimum of thirteen units. Those lacking a computer applications background must pursue an approved minor in an appropriate applications field. For degree certification a 4.0 grade-point average must be maintained for all graduate and computer science courses.

Master of Science in the Teaching of Computer Science. The objective of this program is to prepare competent and well-qualified teachers of computer science for undergraduate colleges, junior colleges, vocational-technical colleges, and high schools.

Candidates for the Master of Science in the Teaching of Computer Science must earn four units in computer science, two units in education, and two units in electives. The electives must be chosen as a sequence for specialization in some area relevant to computer science education.

Each student is required to complete a teaching project in computer science. This requirement will normally be fulfilled in connection with specified course work in the curriculum, the electives, individual study courses, or by virtue of the student's current or past employment. For degree certification a 4.0 grade-point average must be maintained for all graduate and computer science courses.

Admission to the MSTCS and MCS Programs. The Depatment of Computer Science will consider applications for admission to these programs if the applicant: holds a baccalaureate or higher degree equivalent to that granted by the University of Illinois and has had at least one course in computer programming.

A brochure giving the details of these programs and their requirements is available directly from the department.

DAIRY SCIENCE

Head of the Department: K. E. Harshbarger
Correspondence and Information: Department of Dairy Science, University of Illinois at Urbana-Champaign, 315 Animal Sciences Laboratory, Urbana, Illinois 61801

FACULTY

Professors: M. P. Bryant, C. L. Davis, K. E. Harshbarger, R. L. Hays, B. L. Larson, J. R. Lodge, G. W. Salisbury
Associate Professors: D. E. Bauman, J. H. Clark, C. N. Graves, M. Grossman, S. L. Spahr
Assistant Professors: C. R. Baumrucker, R. B. Hespell, A. J. Lee, R. B. Rindsig, J. L. Robinson

Graduate Programs. The Department of Dairy Science offers a program of graduate study leading to the Master of Science and Doctor of Philosophy. This program offers advanced work in several fields of specialization in dairy science including biochemistry; genetics; management; microbiology; nutrition; and physiology of lactation and reproduction. Each graduate student must select, in consultation with the head of the department, a faculty adviser and one of the fields of specialization.

Admission. The student must demonstrate reasonable proficiency in physical and biological sciences at the undergraduate level and an interest in agricultural sciences.

Fellowships and graduate assistantships are available on a competitive basis. Graduate assistantships offer students an opportunity to obtain teaching and/or research experience. Appointments are made for a twelve-month period, including one month of vacation.

Master of Science. A candidate for the Master of Science must complete a minimum of eight units of credit, including five units of lecture and laboratory courses, one-half unit of seminar, and two units of thesis research. At least three units of credit must be 400-level courses; two of these in Dairy Science. A comprehensive examination concerning the thesis and the disciplines used in the field of dairy science is required. The thesis requirement may be waived by petition to the department and completion of nine units of credit and a comprehensive oral examination. The student is expected to complete the M.S. degree within a two-year period. Financial support is limited to two years unless extended by departmental action.

Doctor of Philosophy. A candidate for the Doctor of Philosophy must complete the M.S. degree, seven units of advanced formal courses, one unit of seminar, and eight units of thesis research. The advanced course requirements depend upon the area of study in which the student specializes and upon career objectives. The doctoral program includes a preliminary examination, a dissertation covering the thesis research, and a final examination. The preliminary examination should be completed prior to enrollment in more than twelve units of credit beyond the M.S.

DANCE

Head of the Department: OLIVER J. KOSTOCK
Correspondence and Information: Department of Dance, University of Illinois at Urbana-Champaign, 4-305 Krannert Center for the Performing Arts, Urbana, Illinois 61801

FACULTY

Associate Professors: B. BLOSSOM, O. J. KOSTOCK, W. W. WARD, JR.
Assistant Professor: P. KNOWLES

Graduate Program. The Department of Dance offers a program of graduate study leading to the Master of Arts. This program offers advanced work in choreography, technique, production, history, philosophy, and pedagogy, plus the option of work in art, music, and theatre.

Admission. A student who wishes to be considered for admission to graduate study in dance must have previous work in dance and the related fields of art, music, and theatre. All applicants for the graduate program in dance must pass an audition to confirm proficiency in both modern and ballet techniques. In addition, all graduate applicants will be required to demonstrate facility in choreography. Preference is given to full-time students who will be active degree candidates.

All students requesting financial assistance must have completed the audition requirement by the end of January for entrance the following fall semester.

Master of Arts. A candidate for the Master of Arts must spend a minimum of two semesters and a summer session in residence. Of the eight units required for the degree, a minimum of four must be in dance. Required courses in dance will be determined on the basis of the candidate's background. Graduate students must enroll in technique class every semester in residence.

In addition to the four units required in dance, each candidate must take two units in choreography at the 400 level, plus a presentation of substantive, acceptable dances choreographed and staged by the candidate. The remaining two units are electives and may be taken in dance; the related fields of art, music, and theatre; or outside the fine arts area.

ECONOMICS

Chairman of the Department: P. T. HARTMAN
Correspondence and Information: Department of Economics, University of Illinois at Urbana-Champaign, 330 Commerce Building (West), Champaign, Illinois 61820

FACULTY

Professors: M. AOKI, V. L. BASSIE, W. BAER, R. BRANDIS, H. J. BREMS, J. E. DUE, R. FERBER, D. P. FLANDERS, H. FOLK, M. FRANKEL, F. M. GOTTHEIL, P. T. HARTMAN, A. J. HEINS, D. R. HODGMAN, G. G. JUDGE, W. W. MCMAHON, J. R.

Millar, L. J. Mirman, D. W. Paden, J. B. Parrish, J. D. Phillips, R. W. Resek, P. Schran, J. Scoville, F. R. Shupp, J. L. Simon, C. M. Sprenkle, K. Taira, T. Takayama, P. J. Wells, T. A. Yancey

Associate Professors: R. J. Arnould, M. Ferber, R. W. Gillespie, R. D. Husby, R. E. Kihlstrom, J. H. Leuthold, L. D. Neal, R. N. Schoeplein; S. W. Steinkamp, P. Uselding, H. F. Williamson, Jr.

Assistant Professors: D. G. Bagby, F. Blau, M. B. Canzoneri, T. S. Friedland, W. E. Hendricks, A. M. Isserman, L. Kahn, R. Koenker, M. Okuno, R. J. Parker, D. J. Poirier, A. Postlewaite

Graduate Programs. The Department of Economics offers graduate work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. The candidate for an advanced degree may specialize in the following fields: economic theory; history of economic thought; public finance; monetary theory and policy; international economics; economic history; labor economics; growth and development; comparative economic systems; urban and regional economics; mathematical economics; econometrics; and industrial organization.

Admission. The results of the Graduate Record Examination should accompany applications for admission. The student is expected to have had at least two semesters of calculus and one of linear algebra.

Master of Arts or Master of Science. There are two ways to earn the master's degree. Students seeking only this degree are encouraged to take Program I which requires two units of theory, one unit of statistics (or demonstration of proficiency), and one unit of economic history or history of economic thought (or demonstration of proficiency). Four additional units are required, two of which must be master's thesis work. Program II requires twelve units of work including the four units of basic requirements described for Program I; two units in a specialized field in economics; and six additional units of which three must be in economics and three may be electives.

Doctor of Philosophy. The following requirements must be met: one unit of advanced theory; one unit each of history of economic thought and economic history; two units in statistics and econometrics (or demonstration of proficiency); at least two units in three specialized fields, two of which must be in economics; and additional units to bring the total to twenty-four of which eight must be doctoral dissertation units and one a workshop and research seminar. The candidate is required to pass written preliminary examinations covering economic theory and three specialized fields (course work with appropriate grades may be substituted for one examination), give an oral defense of the dissertation proposal, and pass an oral final examination covering the research. Students with an appropriate background in economics and mathematics who devote full time to graduate work can complete the Ph.D. in three years beyond the bachelor's degree. An additional year or more is usually necessary, however, for those holding part-time assistantships.

EDUCATION

(Including Administration, Higher and Continuing Education, Educational Policy Studies, Educational Psychology, Elementary and Early Childhood Education, Secondary Education, Special Education, and Vocational and Technical Education)

Dean of College of Education: J. Myron Atkin

Correspondence and Information: Assistant Dean for Graduate Programs, College of Education, University of Illinois at Urbana-Champaign, 120 Education Building, Urbana, Illinois 61801

FACULTY

Professors: R. C. Anderson, J. M. Atkin, P. G. Braunfeld, M. Burlingame, J. R. Burnett, F. D. Carver, R. J. Colwell, C. B. Cox, R. B. Davis, T. Denny, D. Durkin, J. A. Easley, R. H. Ennis, R. N. Evans, W. Feinberg, L. R. Goulet, N. E. Gronlund, J. T. Hastings, P. E. Hemp, R. A. Henderson, B. Hicks, J. Hill, K. T. Hill, L. G. Humphreys, W. D. Johnson, R. S. Jones, L. Jordan, C. J. Karier, M. B. Karnes, L. G. Katz, A. B. Knox, E. C. Leppert, H. H. Lerch, R. Linn, M. L. Maehr, T. Manolakes, J. E. McGill, C. J. McIntyre, W. P. McLure, F. McMurray, L. E. Metcalf, W. Moore, C. H. Patterson, A. Peshkin, H. G. Petrie, L. J. Phipps, A. Purves, S. P. Quigley, J. Raths, F. M. Raubinger, F. A. Rodgers, S. Rosen, B. Rosenshine, L. J. Rubin, T. J. Sergiovanni, P. B. Shoresman, R. H. Simpson, J. M. Slater, R. L. Sprague, R. A. Smith, H. T. Spitze, B. Spodek, R. Stake, M. Tatsuoka, R. M. Tomlinson, K. J. Travers, L. R. Tucker, J. L. Walker, R. E. Williams, J. S. Zaccaria

Associate Professors: E. F. Anderson, T. H. Anderson, R. K. Brown, R. A. Burnham, A. B. Campione, J. C. Campione, F. D. Carver, D. Clegg, L. B. Cohen, J. E. Erickson, E. L. Evertts, J. A. Farmer, J. A. Fley, O. E. Gould, M. B. Griggs, A. D. Groteluesche n, L. W. Heal, G. A. Hoke, E. R. House, J. R. Jenkins, F. L. Johnson, H. R. Kaczkowski, K. R. Koenke, M. S. Lilly, J. W. Loeb, T. J. Long, A. L. Madsen, T. L. McGreal, H. A. Moses, A. Ortony, R. F. Payette, M. J. Phillips, H. J. Sredl, J. Stern, R. A. Tinkham, H. Trueba, P. C. Violas, R. W. Walker, J. L. Wardrop, C. M. Weller, C. K. West, I. D. Westbury, B. A. Yates, R. R. Zehrbach

Assistant Professors: J. D. Anderson, S. R. Asher, R. M. Beecher, D. Brandenburg, E. Bredo, J. Brun, G. F. Canney, L. Clinton, J. R. Dennis, A. J. Diekema, R. G. Erskine, D. L. Essex, H. Farmer, M. Fiedler, J. L. Forsythe, W. H. Foster, V. P. Franklin, D. Frisbie, T. E. Gamble, M. W. Gold, C. J. Jackson, S. J. Kilmer, C. Kozoll, S. R. Levy, J. Mancuso, J. Mason, W. E. Maxwell, E. F. McClure, R. Nelson, D. Omark, R. S. Pelczar, D. L. Pierce, P. S. Riegel, M. M. Shorish, M. A. Siegel, R. Smock, R. J. Spiro, B. E. Swanson, R. Tate, P. W. Thurston, D. R. Tunnell, M. Vittetoe, M. Wade, N. Weinberg-Asher, B. Wilcox-Cole

Graduate Programs. Graduate students in the College of Education may specialize in:

Agricultural education
Aesthetic education
Behavioral foundations of education
Bilingual, bicultural education
Business, office, and distributive education
Comparative education
Continuing education
Computer applications in education
Computer-assisted instruction
Counselor education
Culture-based education
Curriculum
Early childhood education
Early childhood education for the handicapped
Educational administration and supervision
Educational psychology
Educational technology
Elementary school subject specialties
(mathematics, language arts, science, social sciences)

Evaluation and measurement
General learning specialist
Health occupations education
Higher education
History of education
Home economics education
Human development
Industrial education
Learning and instruction
Philosophy of education
Quantitative and evaluative research methodologies
Reading
Rehabilitation counseling
Secondary education (English, mathematics, music, physical education, science, social science)
School psychology
Social foundations of education
Sociocultural perspectives for education
Special education:
a. teacher preparation (special and behavior problems, severe behavioral handicaps, early childhood education, skills improvement)
b. preparation for leadership positions (teacher education, research, program administration)
Teacher education (elementary and secondary)
Vocational and technical education

Many other areas of specialization within education may be developed by the student and adviser. The department is especially well organized to permit interdisciplinary studies.

Admission. Most applicants hold teaching certificates but certification is not required for advanced graduate study in all fields. Certification can be achieved through special arrangements and additional work when it is desired or required as part of a program of study. All applicants for study leading to doctoral degrees and some Advanced Certificates must provide Miller Analogies test scores. All applicants for graduate degrees in the Department of Speical Education must submit either Miller Analogies or Graduate Record Examination test scores, three letters of recommendation, and a graduate appointment form with their application. The Department of Educational Psychology requires applicants for all graduate degrees to provide Miller Analogies and Doppelt Mathematical Reasoning test scores.

Master of Arts and Master of Science. These degrees are for the research-oriented student. Eight units of study are required with the exception that students in the Department of Educational Administration must complete a ten-unit program. Each student must spend at least one year in residence, write a master's thesis, and defend it before a faculty committee. No more than two units count for thesis credit. Any two courses selected form History and Philosophy of Education 300 to 307, and Educational Psychology 311 and 312 are required, except from students who pass proficiency examinations in these courses. Credit earned on the credit-no credit option may not be counted toward this degree.

There may be one or two minors. In general, candidates for the Master of Education are expected to take at least two units in fields other than education, particularly if the specialization is in secondary education. One unit at the 300 level in the

teaching subject or subjects may be substituted for one of the three units at the 400 level otherwise required.

Master of Education. This is a professional degree disigned for those students seeking broad, fundamental, and practical preparation for work in the education professions. Students must complete eight units of study although students in educational administration must complete a ten-unit program. No thesis is required. Students may take four units of course work toward the degree on an extramural basis. Four units must be taken in residence; one way this requirement may be met is for the student to take two units each summer session for two summers. Any two courses selected from History and Philosophy of Education 300 to 307, and Educational Psychology 311 and 312 are required, except from students who pass proficiency examinations in these courses. Credit earned on the credit-no credit option may not be counted toward this degree.

There may be one or two minors. In general, candidates for the Master of Education are expected to take at least two units in fields other than education, particularly if the specialization is in secondary education. One unit at the 300 level in the teaching subject or subjects may be substituted for one of the three units at the 400 level otherwise required.

The Advanced Certificate in Education. A master's degree in an appropriate field is required for admission to the Advanced Certificate program. Since this degree is a professional degree, two years of successful professional experience in education are required for admission. A minimum of eight units is required for the degree, four of which must be in residence. Four units must be at the 400 level. Up to four units of work may be taken in extramural courses. No thesis is required for this degree. Students who have not previously taken any two courses selected from History and Philosophy of Education 300 to 307 and Educational Psychology 311 and 312, or equivalents, must take them or pass proficiency examinations. Credit earned on the credit-no credit option may not be counted toward this degree.

Doctor of Education. Programs leading to the Doctor of Education are designed to provide advanced professional training and develop further ability in the scholarly study of professional problems. Sixteen units of course work beyond the master's degree are required. Extramural credit may not be counted in this requirement. A thesis is required in addition to the sixteen units of course work. Minimum residence requirements may include either two consecutive semesters of at least three units each, or one semester of at least three units, plus the summer session immediately preceding or following, of at least one and one-half units.

Students must complete two perspective options designed to help them systematically understand and interpret their developing practitioner-scholar role.

Between admission and completion of degree requirements, an Ed.D. student must complete a supervised field work experience of from one to four units in which he/she effectively alternates between professional action and relevant organized knowledge.

Doctor of Philosophy. This program is planned by the student with an adviser to develop the student's ability to do research in a specialized field of education. To become a candidate, the applicant must hold a master's degree with a major in education or some appropriate related subject. An applicant who has not written a master's thesis is required to prepare, submit, and defend a paper equivalent to a master's thesis.

Sixteen units of residency credit is required. Acceptance of credit for work earned elsewhere does not reduce the residence credit requirement. The residence period must include two successive semesters beyond the first stage in which the student takes a minimum of three units each semester.

A student is required to demonstrate competence in one of several research technique options. The general requirements of the Graduate College for the Ph.D. degree must be met.

Each Ph.D. candidate in the College of Education should, as a part of the graduate program, complete an approved supervised professional work experience that consists of at least one-half time work for a semester. This requirement is to be competed during the period between admission and completion of degree requirements.

ELECTRICAL ENGINEERING

Head of the Department: E. C. JORDAN

Correspondence and Information: Department of Electrical Engineering, University of Illinois at Urbana-Champaign, 155 Electrical Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: H. W. ADES, F. T. ADLER, G. E. ANNER, M. AOKI, R. B. ASH, D. L. BITZER, S. A. BOWHILL, R. M. BROWN, B. E. CHERRINGTON, R. T. CHIEN, P. D. COLEMAN, J. B. CRUZ, JR., G. DESCHAMPS, F. DUNN, J. D. DYSON, W. L. EMERY, E. W. ERNST, O. L. GADDY, A. H. HADDAD, P. HANDLER, D. F. HANG, C. D. HENDRICKS, JR., F. HOHN, N. HOLONYAK, JR., D. F. HOLSHOUSER, E. C. JORDAN, P. KOKOTOVIC, B. C. KUO, S. W. LEE, C. H. LIU, Y. T. LO, P. E. MAST, W. MAYEDA, P. E. MAYES, G. A. METZE, R. MITTRA, D. E. MULLER, S. MUROGA, T. A. MURRELL, W. R. PERKINS, D. PINES, W. J. POPPELBAUM, F. PREPARATA, N. NARAYANA RAO, S. R. RAY, J. E. ROBERTSON, S. N. ROSCOE, C. T. SAH, C. F. SECHRIST, JR., B. G. STREETMAN, G. W. SWENSON, JR., T. N. TRICK, M. E. VAN VALKENBURG, J. T. VERDEYEN, H. M. VONFOERSTER, N. WAX, H. D. WEBB, K. C. YEH

Associate Professors: J. W. BEAUCHAMP, J. M. CROWLEY, E. S. DAVIDSON, T. A. DETEMPLE, M. FAIMAN, M. A. GELLER, R. L. JOHNSON, W. J. KUBITZ, E. A. MECHTLY, H. MERKELO, P. L. RANSOM, H. G. SLOTTOW, R. J. TURNBULL, L. WOZNIAK

Assistant Professor: P. D. SCHOMER

Graduate Programs. Graduate study in electrical engineering, leading to the degrees of Master of Science and Doctor of Philosophy, is offered in four general areas: circuits and systems, which includes network synthesis, nonlinear circuits, control systems, and optimization; computers and information systems, which includes computers, switching theory, information theory, communication theory, information retrieval and artificial intelligence; electromagnetic fields, which includes antennas, propagation, aeronomy, radio location, and holography; physical and quantum electronics, which includes solid state theory and devices, electrophysics, optical electronics, plasmas, gaseous electronics, and charged particles. In addition, the department cosponsors or participates in interdisciplinary areas of specialization in bioengineering, nuclear engineering, radio astronomy, biomedical instrumentation, ultrasonics, and electronic music.

Admission. Graduates of electrical engineering curricula substantially equivalent to that of the University of Illinois are eligible for admission. Graduates of curricula in the physical sciences and mathematics may also be admitted to advanced study if they have the necessary background to profit from graduate work in electrical engineering.

Master of Science. A minimum of eight units including a one or two unit thesis, must be completed for the master's degree. At least four units must be 400-level courses (thesis units may be included in this total), including specific courses in two of the four basic areas. Courses which are required in the undergraduate curriculum at Illinois cannot be applied to the credit requirements for an advanced degree. No final examination is required for the M.S. degree.

Doctor of Philosophy. All students desiring to enter the doctoral program must take the electrical engineering qualifying examination. Students who earn the master's degree at the University of Illinois take the examination during the term they earn their ninth unit of graduate credit. Students who enter with the master's degree take the examination during the first term here. Admission to the doctoral program is based upon the quality of the course work, the qualifying examination, and an assessment of the ability of the candidate to do independent research work.

Eight units of course credit beyond the master's degree or equivalent, successful completion of the preliminary examination, eight units of thesis research, a satisfac-

tory thesis, and satisfactory defense of the thesis in a final examination are minimum requirements for the degree of Doctor of Philosophy. If required by the adviser, a student must have one or two minors in addition to the major. A single minor requires four units in one field outside the major field, at least one of which must be at the 400 level. If two minors are required, each must consist of at least two units. Advanced courses in mathematics, physics, physiology, chemistry, nuclear engineering, and other branches of engineering are recommended minors. No foreign language proficiency is required.

Extramural Study. The department offers extramural graduate courses administered by the Division of University Extension leading to the Certificate in Engineering granted by the Extension Division. Requirements for the M.S. degree can be fulfilled by one semester of residence after completing the requirements of the certificate program. For information about this certificate program, write to the Division of University Extension, University of Illinois at Urbana-Champaign, 112 Illini Hall, Champaign, Illinois 61820.

Under special circumstances, it may be possible to complete the M.S. degree off-campus by taking extramural graduate courses that are designated for residence credit including the M.S. thesis requirement. Such cases are considered on an individual basis upon petition to the departmental graduate committee.

ENGLISH

Head of Department: George Hendrick
Director of Graduate Studies: C. H. Shattuck
Correspondence and Information: Director of Graduate Studies, Department of English, University of Illinois at Urbana-Champaign, 102b English Building, Urbana, Illinois 61801

FACULTY

Professors: A. L. Altenbernd, R. Barksdale, N. Baym, B. Benstock, E. J. Brandabur, J. J. Campbell, E. H. Davidson, J. Friedman, R. Halsband, G. Hendrick, A. G. Holaday, J. R. Hurt, K. Kinnamon, D. V. Kramer, R. W. Rogers, M. Rose, C. Sanders, C. H. Shattuck, J. Stillinger, B. F. Wilkie, H. W. Wilson
Associate Professors: G. Adelman, H. C. Cole, J. Dundas, A. Dussinger, J. Frayne, P. Garrett, F. E. Hodgins, A. Kaufman, U. M. Kaufmann, C. Kyle, D. Majdiak, H. Marder, D. Matthews, F. Moake, C. Nelson, R. L. Schneider, G. Scouffas, M. Shapiro, B. Smalley, J. C. Stubbs, A. M. Tibbetts, J. B. Trahern, M. Uroff, L. Waldoff, E. Watts, R. Wheeler
Assistant Professors: D. Baron, R. Carringer, L. Danielson, A. Guibbory, J. L. Hinely, W. D. Kay, J. Klein, J. F. Stottlar

Graduate Programs. The Department of English offers a full course of study leading to the Master of Arts and Doctor of Philosophy degrees. The Ph.D. program is, in general, designed to educate and train teacher-scholars who will take up positions in colleges and universities thoughout the country. The Master of Arts program may be either a first step toward this professional degree or a final educational state for qualified students who wish to pursue their knowledge of English and American language and literature beyond the undergraduate level. A special program for teachers, the Master of Arts in the Teaching of English is also offered. There is no creative writing program.

Admission. A student who wishes to be considered for admission to graduate work in English must present the equivalent of at least twenty semester hours of undergraduate college work in English and American literature, excluding required college work in rhetoric or composition. Applicants are required to submit G.R.E. scores.

Because applications for admission usually far exceed capacity, in recent years undergraduate grade-point averages of students admitted have been significantly higher than the 4.0 required by the Graduate College. The committee on admissions tends to select those applicants showing a solid undergraduate array of courses, a mastery of a foreign language, and real promise of earning degrees within a reasonable time. Preference must be given to full-time students who will be active degree candidates. Financial aid is available to a limited number of students in the form of fellowships, teaching assistantships, and waivers of tuition and fees. Applicants are considered at only one time of year, and the deadline for submitting applications is February 15. For complete information about the program, prospective applicants should send to the above address for the department's handbook on Graduate Studies in English.

Master of Arts. A candidate for the A.M. in English must spend at least two semesters or the equivalent in residence, and elect at least eight units of course work distributed among the chronological areas of English and American literature. The student must show a knowledge of one foreign language equivalent to that acquired by three years of undergraduate course work as determined by the appropriate Educational Testing Service examination. A full-time student can complete this program in an academic year.

Doctor of Philosophy. A student wishing to continue beyond the master's must apply formally and is considered in competition with applicants who are taking the master's elsewhere. Seldom are applicants accepted with graduate averages below 4.5. The student takes eight units of course work, planned in consultation with a two-member advising committee. There are no general requirements for further foreign language work, philology-linguistics, or outside minors, although certain fields of specialization do require further work along these lines. There are three formal examinations: the proficiency, general, and special examinations, which are taken at various stages of the student's progress. The first of these examinations tests the student's general critical ability; the second, general literary knowledge; and the third, competence in the field of study chosen as the student's area of concentration. Having passed these examinations, the student goes on to write a dissertation under the direction of a committee composed of three professors. A full-time student can complete this program in three years beyond the master's degree.

ENGLISH AS A SECOND LANGUAGE

Director of the Division: KATHARINE ASTON
Correspondence and Information: Director, Division of English as a Second Language, University of Illinois at Urbana-Champaign, 3070 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: K. ASTON, Y. KACHRU
Associate Professor: L. BOUTON
Assistant Professors: T. BUCKINGHAM, J. COWAN, L. DICKERSON, W. DICKERSON, R. DIXON, E. ENATA, M. KEEN, S. TAYLOR

Graduate Program. The Division of English as a Second Language offers a Master of Arts in the Teaching of English as a Second Language. The curriculum leading to this degree includes a minimum of eight units, two of which must be taken from 400-level courses. Upon completion of his or her course work, each candidate must pass a written comprehensive examination. No thesis or master's paper is required. The curriculum is interdisciplinary and offers students the chance to specialize in one of four different streams: General (English as a Second/Foreign Language), ESL/EFL

and Bilingualism, ESL/EFL Administration, and Materials Development. Underlying all four streams are three core courses and two practicums involving the description of the structure of English and the application of that description to various teaching situations. In addition, there are also (1) required subject areas relevant to each particular stream, from which students in that stream must select one of several courses, and (2) open electives, one unit of which may be taken credit-no credit. Examples of the subject areas required in various streams are Reading/Composition in ESL, General Linguistics, Language Acquisition, Language and Culture, Evaluating Linguistic Proficiency, Bilingual Education, and Contrastive Analysis. Through the scope and diversity of its courses, the master's program prepares personnel for both overseas and domestic ESL opportunities.

In addition to the on-campus program, the Division of English as a Second Language cooperates with Tehran University in offering students in the MATESL curriculum an overseas internship, through which qualified candidates can earn their MA while gaining experience in the field. Interns complete two of the required eight graduate units of course work on the Urbana campus during an eight-week summer orientation prior to leaving for Iran. The other six units can be earned while on the job through courses offered by the University of Illinois or Tehran University.

The degree of Doctor of Philosophy, with a specialization in the Teaching of English as a Second Language, is available both through the College of Education and through the Department of Linguistics. In either of these options, the faculty of the Division of English as a Second Language is available to serve on the various doctoral committees and, of course, ESL courses help to form the backbone of the specialization itself. Applicants interested in working toward their doctorate in this area should write to Dr. Martin Maehr, associate dean for graduate programs, College of Education, or to Dr. Braj Kachru, head, Department of Linguistics.

Admission. Applicants for admission should present appropriate academic preparation in a relevant discipline such as English, linguistics, a foreign language, or a teacher training curriculum in one of the above or in elementary education. Native speakers of English must have studied at least one foreign language for four university semesters or the equivalent, or demonstrate an acceptable proficiency in a foreign language. Nonnative speakers of English must demonstrate an acceptable proficiency in English by attaining a score of at least 580 on the TOEFL examination. Note that the TOEFL examination is required of all applicants to the MATESL curriculum who are not native speakers of English even when the requirement for that examination has been waived by the University itself.

Financial assistance is not normally awarded during a MATESL candidate's first semester. Exceptions to this policy are sometimes made when an applicant has had extensive ESL experience, for example, in the Peace Corps, or has an exceptional academic record. There are a number of teaching assistantships available to qualified students who have completed their first semester's work.

ENVIRONMENTAL STUDIES

Director: B. B. Ewing

Correspondence and Information: Institute for Environmental Studies, University of Illinois at Urbana-Champaign, 911 West High Street, Urbana, Illinois 61801

Graduate Programs. The Institute for Environmental Studies provides coordination and support for the development of interdisciplinary and multidisciplinary programs of research, teaching, and public service in the general area of environmental studies. The mission of the institute is accomplished through the programs of task forces and the Water Resources Center.

Task forces include the study of lead and other metals in the environment, environmental impact of coal conversion plants, water pollution, the study of toxic substances, and land and water resources planning. The metals task force involves about thirty graduate students from various fields of specialization. The two new task forces provided, shortly after their inception, support for three to five graduate students. The Water Resources Center in the 1972-73 academic year provided support for approximately thirty-five graduate research assistants located at five educational institutions in Illinois. A little over half of these were on the Urbana-Champaign campus of the University of Illinois.

The institute offers twelve Environmental Studies courses or seminars. No academic degree programs are offered in Environmental Studies.

EXTENSION EDUCATION

Graduate Adviser and Professor: GERTRUDE E. KAISER
Correspondence and Information: Extension Education, University of Illinois at Urbana-Champaign, 329 Mumford Hall, Urbana, Illinois 61801

Graduate Program. The Master of Extension Education is a professional program providing advanced study in agriculture and home economics, including further study in the social sciences.

Admission. Applicants are expected to hold a bachelor's degree in agriculture, home economics, or a closely related field.

Degree Requirements. The program consists of a minimum of eight units with a thesis or nine units without a thesis. Three units must be in 400-level courses with one unit in the major field. A major, consisting of four units, may be taken in agriculture, home economics, or the social sciences. Students majoring in agriculture or home economics select four additional units from the social sciences; those majoring in the social sciences select four additional units from agriculture or home economics. All courses selected must be approved by the student's adviser. If a thesis is not submitted, the ninth unit may be selected in any area approved by the adviser. At least four units must be earned in residence on the Urbana-Champaign campus. Total extramural credit cannot exceed three units.

FINANCE

Head of the Department: JAMES W. LEONARD
Correspondence and Information: Department of Finance, University of Illinois at Urbana-Champaign, 340 Commerce Building (West), Urbana, Illinois 61801

FACULTY

Professors: C. T. ARLT, W. R. BRYAN, T. E. CAMMACK, J. A. GENTRY, R. W. MAYER, R. I. MEHR, R. C. OSBORN, F. K. REILLY, P. M. VAN ARSDELL (emeritus)
Associate Professors: S. W. FORBES, J. W. LEONARD, C. M. LINKE
Assistant Professors: K. L. GUNTERMANN, M. J. LYNGE, JR., C. F. SIRMANS, JR., G. C. WAGNER, D. H. WORT, J. K. ZUMWALT

Graduate Programs. The Department of Finance offers graduate work leading to the Master of Science and Doctor of Philosophy. The following fields are available for specialization: money, credit, and banking; corporation finance; investment; insurance; and urban economics and real estate.

Admission. The applicant is expected to have had at least twenty-seven hours of undergraduate work in social science, fifteen hours of which must have been in economics, including a course in principles of economics and other courses for which the course in principles is a prerequisite; credit in the courses in mathematics and statistics required for the bachelor's degree from the College of Commerce and Business Administration at the University of Illinois, or their equivalent, and sufficient background in the finance area and the related fields of accountancy and business administration to support, in the judgment of the graduate adviser, the candidate's educational objective.

A candidate who elects finance as a minor for either the master's degree or the doctorate must have had at least twelve hours of undergraduate work in social science, eight hours of which must have been in economics, including a course in principles of economics and other courses for which the course in principles is a prerequisite, and sufficient background in the finance area and in the related fields of accountancy and business administration to support, in the judgment of the graduate adviser, the candidate's educational objective.

Master of Science. A candidate for the master's degree must spend at least two semesters in residence. The credit requirement for this degree is eight units if the student chooses the thesis option or ten units if he chooses the nonthesis option. Two units of economic theory are required under both options. Two units of quantitative analysis are required under the nonthesis option and one unit is required under the thesis option.

Doctor of Philosophy. The doctoral candidate must obtain credit in the second course in calculus, a course in economic statistics, and a course in operations research at the graduate level. The first stage must include two units of economic theory, four units of finance, and two additional units in finance or related fields. The second stage includes eight units which provide a concentration in finance, understanding of one or more fields in economics in addition to economic theory, and proficiency in any other minor field offered. Further graduate study in the quantitative areas is advised for such candidates. After passing written preliminary examinations in each of his or her five areas, the candidate must pass an oral preliminary examination which is devoted primarily to his or her thesis proposal. Following the oral examination the candidate engages in eight units of independent research and seminars devoted to the dissertation.

FOOD SCIENCE

Head of the Department: ARTHUR J. SIEDLER

Correspondence and Information: Director of Graduate Studies, Department of Food Science, University of Illinois at Urbana-Champaign, 567 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: B. E. HASKELL, F. A. KUMMEROW, A. I. NELSON, T. NISHIDA, Z. J. ORDAL, E. G. PERKINS, A. J. SIEDLER, M. P. STEINBERG, J. TOBIAS, W. J. VISEK, R. M. WHITNEY, L. D. WITTER

Associate Professors: P. V. JOHNSTON, L. S. WEI

Assistant Professors: C. ARGOUDELIS, R. R. BELL, J. W. ERDMAN, L. K. FERRIER, J. A. MILNER, V. L. PORTER

Graduate Programs. The Department of Food Science offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. In addition to receiving training in the general field of food science, students have the opportunity to do research in the following areas of specialization as they relate to food products: chemistry; engineering; microbiology; nutrition; and processing.

Admission. A student planning to major in food science should have a baccalaureate degree in a recognized field of biological, physical, agricultural, or engineering science. Background deficiencies will be removed with graduate credit courses designed for this purpose.

Master of Science. To obtain a master's degree, a student must have two and three-fourths units in food science. The remainder of the eight units of credit required consists of graduate courses selected from inside or outside the department which are appropriate for the training and development of the student in the field of specialization. A thesis may be required at the option of the candidate and adviser. An oral examination covering the field of food science and the area of the candidate's specialization is also required.

Doctor of Philosophy. In addition to the courses required for the master's degree, candidates for the Doctor of Philosophy must have additional credit in seminar (one-fourth unit) and thesis research (eight units). The rest of the sixteen units required for the degree will consist of graduate courses selected from inside or outside the department which are appropriate for training in the student's field of specialization. In addition, the candidate must demonstrate proficiency in one foreign language, as approved by the adviser, in which adequate scientific literature exists and which is neither the student's native tongue nor English. Also the student must complete a special option approved by the adviser which may be counted as part of the sixteen required units of credit. Upon the completion of all formal courses, language and special option requirements, or during the last semester of the course work, the student is required to take a series of written preliminary examinations. The final eight units after passage of the preliminary examinations are spent in research. Upon the submission of the dissertation, the candidate is admitted to the final oral examination before a faculty committee. Students specializing in nutrition may elect to receive their degree in nutritional sciences by satisfying the specific requirements of that program. (See page 116.) Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

FORESTRY

Head of the Department: I. I. Holland
Correspondence and Information: Department of Forestry, University of Illinois at Urbana-Champaign, 211 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: A. R. Gilmore, I. I. Holland, C. S. Walters
Associate Professors: F. A. Bazzaz, P. Chow, D. E. Koeppe
Assistant Professor: G. L. Rolfe

Graduate Program. The Department of Forestry offers graduate work leading to the Master of Science degree. The Doctor of Philosophy degree is not granted by the department, but qualified students may work toward this degree with a forestry adviser who holds a joint appointment in another department, or is on the staff of an interdisciplinary doctoral program. Such areas of study include economics, environmental biology, genetics, plant physiology, and soils.

Admission. The prerequisite for graduate study is a bachelor's degree in forestry or a closely related field.

Master of Science. To qualify for the master's, a student must earn eight or more units of graduate credit with at least three units in courses at the 400 level. Depending upon their backgrounds, nonforestry graduates may be required to complete certain basic

forestry courses in addition to the regular degree requirements. Programs are designed to serve the needs of each student and to deepen understanding in such areas as land use, ecology, economics, genetics, mensuration, physiology, soils, statistics, or wood science. Advanced courses in special interest fields are found in various departments. In most cases a thesis is required, but it may be waived if such waiver will result in a better program for an individual student. Forestry seminar is required of all graduate students. If a thesis is waived, nine units including three at the 400 level, are required.

FRENCH

Acting Head of the Department: E. Talbot
Correspondence and Information: Department of French, University of Illinois at Urbana-Champaign, 2090 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: A. O. Aldridge, B. C. Bowen, P. Haidu, E. Jahiel, F. Jost, B. H. Mainous, F. Marty, F. W. Nachtmann, R. J. Nelson, Y. Velan
Associate Professors: V. E. Bowen, H. C. De Ley, S. E. Gray, F. M. Jenkins, M. K. Myers, L. B. Price, S. J. Savignon, E. Talbot, P. Weisz
Assistant Professors: A. Kotin, G. Savignon, S. Shinall, B. Wanner, E. Zerbe

Graduate Programs. Three programs are available for candidates for the M.A.. the M.A. in Literature, the M.A. in Expanded French Studies, and the M.A. in the Teaching of French. Predoctoral and doctoral candidates may choose one of two programs: the M.A. — Ph.D. in Literature or the M.A. — Ph.D. in Expanded French Studies. The latter program permits a combination of literary study with course work and research in other aspects of French culture. The Master of Arts in the Teaching of French is designed for those who are interested in teaching in secondary schools or junior and community colleges. The Doctor of Philosophy is designed to prepare (a) scholar-teachers at the college or university level, and (b) specialists in francophone culture looking to careers in others fields (government, industry, and public service, etc.).

Admission. Students are normally considered for admission to the M.A. who have an overall undergraduate admission average of 4.0 with an average in French courses of 4.5.

Students electing French as a major subject should have had a college major in French, including practical work in the use of the language and advanced work in literature. Entering students are given a diagnostic test to determine whether remedial work in French language courses is necessary. Some knowledge of other romance languages and literatures is desirable. Students seeking admission to the Ph.D. with a Master of Arts Degree earned elsewhere are expected to have a 4.5 grade average in graduate courses. Their M.A. should be in French Literature or in French Studies.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must take an M.A. examination based on a reading list covering the field of French literature. Those wishing to go on to the doctoral program must write an essay for Ph.D. qualification. The M.A. Examination in Expanded French Studies covers, as well as readings in the field of French literature, material bearing on the candidate's field of specialization in French culture or related disciplines. Candidates in all programs are required to demonstrate, at the time of the M.A. examination, an ability to communicate effectively in both written and oral French. A course in research methods and textual analysis is also required for the M.A.

Master of Arts in the Teaching of French. An applicant for admission is expected to have a bachelor's degree in French teacher education. Candidates for this degree must complete a total of eight units as follows: four units in French civilization, language and/or literature (excluding French 311, 313, 314), at least two of which must be at the 400 level; one unit in educational psychology; one unit in educational policy studies; and two units of electives, one of which must be taken in French. Remedial work in French diction and syntax may also be required of candidates who show deficiences in these areas. In addition to completion of course work, candidates will be required to pass a comprehensive written and oral examination during their last semester of study, demonstrating a satisfactory level of communicative competence in French and the ability to integrate effectively their knowledge of French language, literature, and culture in developing a philosophy and practice of teaching.

An alternative program for candidates who do not have teacher certification requires eleven hours of undergraduate professional education (including seven hours in student teaching), a course in American government, and three hours of health and/or physical education, in addition to the M.A.T. program described above. Candidates should also note that certification by the state of Illinois requires U.S. citizenship or a declaration of intent.

Doctor of Philosophy. Two programs are available leading to the Ph.D., one in literature (with an option permitting students with the proper background to specialize in linguistics or second-language acquisition) and one in Expanded French Studies, which allows for specialization in francophone culture and research in related disciplines.

Candidates in both programs with M.A. degrees earned elsewhere will be expected to pass a qualifying examination during the first half of their first semester in residence. Details may be obtained from the Departmental Graduate Coordinator.

All candidates are required to include courses in research methods and textual criticism, the history of the French language and French literature. High-level reading proficiency in one language other than French or English is required and, for literature students, one year of college Latin or the equivalent.

Candidates must pass a preliminary examination and write a successful dissertation. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program for students planning a career in teaching.

GENERAL ENGINEERING

Head of Department: J. S. Dobrovolny
Correspondence and Information: T. F. Conry, Department of General Engineering, University of Illinois at Urbana-Champaign, 117 Transportation Building, Urbana, Illinois 61801

FACULTY

Professors: J. S. Dobrovolny, H. W. Knoebel
Associate Professors: T. F. Conry, L. D. Metz, H. Streeter, L. Wozniak
Assistant Professors: W. W. Chow, W. J. Davis, E. I. Odell, M. H. Pleck

Graduate Program. Although the Department of General Engineering does not offer a graduate degree program, it does offer, in collaboration with other departments of the College of Engineering, an area of specialization in engineering project planning and execution, stressing the design function for manufacturing for candidates for the Master of Science. Students in the following areas may elect this option:

mechanical engineering, civil engineering, engineering mechanics, electrical engineering, ceramic engineering, aeronautical and astronautical engineering, industrial engineering, nuclear engineering, and computer science. This area of concentration is organized to prepare students to participate in the solution of problems that cross disciplinary lines. Interested students are encouraged to write for a descriptive brochure.

GENETICS

Correspondence and Information: E. H. Brown, Chairman, Genetics Program Committee, University of Illinois at Urbana-Champaign, 515 Morrill Hall, Urbana, Illinois 61801

Graduate Program. A doctor of philosophy in genetics is provided through the cooperative efforts of a number of departments and is administered by the Genetics Program Committee. Training is available in molecular, microbial, developmental, population, quantitative applied plant and animal, behavioral and human genetics, and in cytogenetics and evolution. Experience is provided with a choice of organisms ranging from viruses to vertebrates. Students seeking master's degrees are directed to the various departmental programs, or to the master's program in biology offered by the School of Life Science.

Admission. Applicants will be evaluated on the basis of their educational background, grade-point average (which must be at least 4.0 = B), Graduate Record Examination (verbal, quantitative and advanced biology) scores, and letters of recommendation. They should have completed courses in quantitative and organic chemistry, trigonometry, analytical geometry, and one year of college physics. Biochemistry and calculus are strongly recommended.

Doctor of Philosophy. During the first year, students determine a program of study in consultation with an adviser and the Genetics Program Committee. During the first two years, students obtain a broad background in the major disciplines of genetics (molecular and microbial, population or quantitative, and cytogenetics) and complete courses or demonstrate proficiency in biochemistry, calculus, and statistics. Thesis research may be carried out under the direction of any of the many staff members engaged in genetics research throughout the University.

GEOGRAPHY

Acting Head of the Department: J. D. Fellmann
Correspondence and Information: Director of Graduate Admissions, Department of Geography, University of Illinois at Urbana-Champaign, 220 Davenport Hall, Urbana, Illinois 61801

FACULTY

Professors: C. S. Alexander, S. A. Chagnon, Jr., J. D. Fellmann, F. W. Foster, W. P. Lowry, H. G. Roepke, D. B. Shimkin, J. Thompson
Associate Professors: G. J. D. Hewings, J. A. Jakle, J. M. Moran, C. C. Roseman
Assistant Professors: J. R. Eyton, D. L. Johnson, J. J. Monk, J. V. O'Loughlin
Lecturer: D. L. Williams

Graduate Programs. The Department of Geography offers work leading to the Master of Arts, Master of Science, and Doctor of Philosophy degrees. A program for prospective teachers, the Master of Science in the Teaching of Geography, is also available. At the master's level the program emphasizes broad understanding of the

main systematic areas of the discipline and the acquisition of basic research competencies; programs for doctoral candidates seek depth in areas chosen for specialization and, through further study in research techniques and in allied disciplines, strive to lead students into innovative research. Detailed descriptions of the programs may be obtained from the departmental office.

Admission. Students applying for admission to the master's programs are expected to have a reasonable undergraduate background in geography. An average of at least 4.25 in the undergraduate major is required. Ph.D. candidates are expected to have at least a 4.5 average in previous graduate work.

Master of Arts and Master of Science. Successful candidates for the master's degree whose backgrounds are largely in physical geography are recommended for the Master of Science; others receive the Master of Arts. At least four of the minimum of eight units of graduate credit required for the master's degree, including research courses, must be in geography. A 4.25 grade-point average is required for degree certification.

Master of Science in the Teaching of Geography. Candidates for this degree must earn four units in geography, two of which are geography electives, two units in education, and two units in electives. Specific degree requirements may be obtained from the degree adviser, Professor Janice J. Monk, 270 Davenport Hall, Urbana, Illinois 61801.

Doctor of Philosophy. Admission presupposes distinction in completing the University of Illinois master's program in geography or its equivalent. In the doctoral program, the student develops depth in areas chosen for specialization and further advances in research competence. Two units of study in allied disciplines and a minimum of six additional units in geography are required. A 4.5 graduate average must be maintained for degree certification. A student must complete the course requirements as determined by an individually planned program, and qualify for the departmental preliminary examination within five semesters of entering the program.

Although there is no departmental foreign language requirement, students may offer a foreign language as a research technique.

GEOLOGY

(Including Earth Science)

Head of the Department: Fred A. Donath
Educational Coordinator: W. Hilton Johnson
Correspondence and Information: Educational Coordinator, Department of Geology, University of Illinois at Urbana-Champaign, 249 Natural History Building, Urbana, Illinois 61801

FACULTY

Professors: A. V. Carozzi, C. A. Chapman, C. W. Collinson, P. A. Domenico, F. A. Donath, D. L. Graf, D. M. Henderson, G. deV. Klein, R. L. Langenheim, Jr., P. A. Sandberg
Associate Professors: D. E. Anderson, T. F. Anderson, D. B. Blake, J. T. Holder, W. H. Johnson, C. J. Mann, D. S. Wood
Assistant Professors: D. D. Eberl, A. S. Nieto, V. V. Palciauskas

Graduate Programs. The Department of Geology offers programs leading to the Master of Science and Doctor of Philosophy in Geology and the Master of Science in the Teaching of Earth Science. Programs in carbonate geology, clay mineralogy, engineering geology and rock mechanics, environmental geology, geochemistry, geophysics, geomorphology and quaternary geology, hydrogeology, marine geology,

mathematical geology, mineral deposits, mineralogy and petrology, paleontology and stratigraphy, sedimentology and sedimentary petrography, structural geology, and transport processes give students a wide choice of courses and areas of specialization.

Admission. Geology majors with basic courses in biology, calculus, chemistry, and physics are given preference, but students from cognate fields are encouraged to apply. An individual program of study will be outlined to provide the essential background to meet the needs of a student with a deficiency in geology or in an allied science.

Some part-time assistants are employed by the State Geological Survey, which is located on campus.

Master of Science. The M.S. requires a minimum of eight units of credit of which two units are normally research credit for a satisfactory master's thesis. Students continuing on for the Ph.D. degree may petition to bypass the writing of a master's thesis and upon passing the preliminary examination may petition to receive the M.S. degree. In exceptional circumstances, terminating students may petition to obtain the M.S. degree without completing a thesis. At least three units of course work must be taken within the department, and at least three units must be completed at the 400 level. The program is normally completed in one to two years.

Master of Science in the Teaching of Earth Science. Candidates must earn four units in geology, two units in other earth science areas, and two units in education (see page 35). At least three units must be at the 400 level. In addition they must fulfill the requirements to be certified to teach at the secondary school level in Illinois.

Doctor of Philosophy. The Ph.D. requires an additional eight units of course work beyond the requirements for the master's degree, and the completion of a satisfactory dissertation, including eight units of research and seminar. At least four of the course units must be taken within the department and at least three units must be at the 400 level. A reading knowledge of French, German, or Russian is required. There are three formal examinations: the reading, the preliminary, and the final examinations. The first of these tests the student's ability to critically evaluate scientific literature, the second is focused on the student's proposed research for the dissertation and tests the student's preparedness for the proposed research, and the third evaluates the student's research ability as demonstrated by the completed dissertation. The program is normally completed in two to four years beyond the master's degree.

GERMANIC LANGUAGES AND LITERATURES

Head of the Department and Graduate Adviser: ELMER H. ANTONSEN
Correspondence and Information: Head, Department of Germanic Languages and Literatures, 3072 Foreign Languages Building, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801

FACULTY

Professors: E. H. ANTONSEN, H. G. HAILE, W. HÖLLERER, H. KNUST, R. LORBE, J. W. MARCHAND, P. M. MITCHELL, I. RAUCH, H. STEGEMEIER
Associate Professors: U. H. GERLACH, J. M. MCGLATHERY, R. SCHIER
Assistant Professors: M. BURKHARD, V. DELL'ORTO, R. FOLTER, C. GRAY, P. GRUNDLEHNER, K. PHILLIPS, K.-H. SCHOEPS, P. SCHWALBE

Graduate Programs. The Department of Germanic Languages and Literatures offers courses of study leading to the degrees of Master of Arts and Doctor of Philosophy in German, and Master of Arts in the Teaching of German. Fields of concentration for the Ph.D. degree are modern German literature; older German literature; and Germanic linguistics. Candidates for the Master of Arts degree may emphasize either

literature or linguistics in their course of study. Detailed information concerning the requirements for advanced degrees is available through the departmental office and will be sent to prospective students along with the necessary application forms.

Admission. Applicants should have completed a four-year course of undergraduate study in German corresponding to that of this University, be familiar with the principal works of German literature, and be able to follow lectures in the German language. Acquaintance with German history, philosophy, science, and art in their relation to the general European background is desirable.

Master of Arts. Candidates for the Master of Arts in German must complete eight units of graduate work and demonstrate proficiency in reading one language other than English and German (normally French). Deficiences in undergraduate preparation may necessitate more than eight units to meet the requirements. Full-time students with good undergraduate training normally complete the requirements in one academic year. The degree is awarded upon the successful completion of a three-hour written and one-hour oral comprehensive examination or upon the successful defense of a thesis. Required courses (or approved equivalents): GER 365; two courses chosen from GER 300, 301, 302; GER 415; GER 420; two advanced courses in German literature; and (for students with an emphasis on literature) GER 411 and GER 495, or (for students with an emphasis on linguistics) GER 412. Electives may be chosen from graduate courses within or outside the department with the approval of the graduate adviser.

Master of Arts in the Teaching of German. Candidates for the M.A.T. must earn four units in approved graduate courses in German, two units in approved courses in the history and philosophy of education, and two units of electives. Candidates must also complete all undergraduate requirements for a teaching certificate, although no graduate credit is given for undergraduate courses. In some cases, graduate courses may be substituted for undergraduate courses. The degree is awarded after successful completion of a three-hour written and one-hour oral comprehensive examination. Full-time students with adequate undergraduate preparation complete the degree in one year.

Doctor of Philosophy. Students working toward the Ph.D. degree must have completed all requirements for the master's degree given above and complete an additional eight units of approved course work. They must demonstrate proficiency in the reading of two languages other than English and German, one of which is normally French. Students in Germanic linguistics may substitute Russian for French, with the second language Scandinavian. After passing the written preliminary examinations (three three-hour comprehensive examinations), the student is admitted to the oral examination, the successful completion of which admits the student to candidacy for the Ph.D. degree. The candidate must then complete eight units of thesis research and successfully defend the thesis in an oral examination. Full-time students complete this program in two years beyond the master's. All candidates for the Ph.D. degree must have taught the equivalent of three one-semester courses on the college level (i.e., one-half time teaching for one academic year) before being admitted to the final oral examination.

GOVERNMENT AND PUBLIC AFFAIRS

Director of the Institute: S. K. Gove
Correspondence and Information: Institute of Government and Public Affairs, University of Illinois at Urbana-Champaign, 1201 West Nevada Street, Urbana, Illinois 61801

The Institute of Government and Public Affairs conducts policy-oriented research and public service. The focus of the research is on important areas of state and local government structure and process with emphasis on the problems of urbanization.

Public service activities arise from and contribute to the research thrust through contact with public officials and the identification of research problems. The Institute offers no courses but its faculty members teach in various departments, guide student research, and direct intern programs. Results of institute research reach a wider audience by publication in institute-sponsored outlets as well as in books and articles published elsewhere. The Institute is an all-University unit that reports directly to the president.

HEALTH AND SAFETY EDUCATION

Head of the Department: WILLIAM H. CRESWELL, JR.
Correspondence and Information: College of Applied Life Studies, Department of Health and Safety Education, University of Illinois at Urbana-Champaign, 121 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professors: W. H. CRESWELL, JR., C. MAYSHARK, R. G. MORTIMER
Associate Professors: L. K. OLSEN, T. W. O'ROURKE, D. B. STONE
Assistant Professor: J. D. BROWN

Graduate Programs. The Department of Health and Safety Education offers programs of study leading to the Master of Science and Doctor of Philosophy degrees. At the master's level the program offers options in school health and community health education. The Ph.D. program is designed to prepare graduates for positions of leadership in teaching, research, and service in colleges, universities, and health-related agencies in the United States and in other countries. Opportunities are available for graduate students who desire to concentrate in additional public health areas through the mechanism of an intercampus program with the School of Public Health, University of Illinois at the Medical Center.

Admission. Students without the equivalent of an undergraduate health education major may be permitted to register for graduate courses but will be required to make up deficiencies in their undergraduate preparations as deemed necessary by their adviser.

The admission requirements for the Ph.D. program include the following: an acceptable grade-point average in undergraduate work and an average of 4.5 for graduate work, an acceptable score on the Miller Analogies Test and on the aptitude section of the Graduate Record Examination, and three letters of recommendation. Candidates are required to have a personal interview with the department head or a representative of the department.

Master of Science. The program of study for the Master of Science (School Health Option) is normally completed in one year of full-time study. Eight units of work are required, including the following: four units in health education, one unit of which may be in approved courses closely related to health education; two units in education; and presentation of an acceptable thesis in health education (two units). Candidates may petition to waive the thesis but will be required to take two units in lieu of thesis credit. Students who elect to write a thesis must take an additional unit of course work in educational statistics if they did not complete a course of a similar nature in their undergraduate study.

The duration of study in the Community Health Option is generally from one to one and a half years depending upon prior education and experience. Eight units of work are required including four units in core courses which are intended to provide the student with an overall knowledge of the public health field and the tools necessary for successful functioning as a community health education specialist; two units of community health related electives; and two units of field work experience in the summer.

Doctor of Philosophy. A master's thesis or equivalent is required for applicants for Ph.D. study. Candidates for this degree must complete a minimum of twenty-five units of credit including the following: a minimum of nine units in the major or related fields; one minor for a minimum of four units, or two minors for a minimum of two units each (in both cases outside the major and related fields); ability to translate accurately two foreign languages, or ability to read, write, and converse satisfactorily in one foreign language (two additional approved graduate course units may be substituted for each of the two foreign languages); a seminar in the major field; and completion of an acceptable dissertation (eight units).

HISTORY

Chairman of the Department: WALTER L. ARNSTEIN
Director of Graduate Studies: CLARK C. SPENCE
Correspondence and Information: Department of History, University of Illinois at Urbana-Champaign, 309 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: W. L. ARNSTEIN, J. L. BATES, P. P. BERNARD, R. B. CRAWFORD, C. E. DAWN, L. E. EASTMAN, W. D. FARNHAM, R. T. FISHER, JR., B. D. HILL, K. A. HITCHINS, R. W. JOHANNSEN, R. M. MCCOLLEY, J. A. NICHOLS, D. E. QUELLER, P. W. SCHROEDER, W. U. SOLBERG, C. C. SPENCE, R. M. SUTTON
Associate Professors: N. M. BELTING, J. R. DAHL, F. C. JAHER, B. L. KLING, T. A. KRUEGER, J. L. LOVE, V. MASTNY, J. P. MCKAY, R. E. MITCHELL, D. L. RANSEL, C. C. STEWART, R. C. TREXLER, B. P. UROFF, R. W. WALLER, H. J. WECHSLER
Asssistant Professors: J. BUCKLER, R. W. BURKHARDT, O. V. BURTON, P. W. DRAKE, C. M. HIBBARD, R. C. JENNINGS, E. M. MELHADO, N. J. PADGETT, J. D. PIERSON, J. H. PRUETT, W. WIDENOR

Graduate Programs. The Department of History offers graduate courses leading to the Master of Arts and the Doctor of Philosophy, complete details of which may be found in the department's brochure on graduate study in history. The Master of Arts degree may be either the first stage in preparation for the degree of Doctor of Philosophy or a terminal degree. Two special programs for teacher training are available, the Master of Arts in the Social Sciences and the Master of Arts in the Teaching of Social Studies. See pages 127 and 128.

The following fields of specialization are offered: ancient Greece; ancient Rome; medieval Europe to 1300; Europe, 1300-1648; Europe, 1648-1815; Europe since 1815; Russia; Eastern or Southeastern Europe; England to 1688; England and the Empire-Commonwealth since 1688; Near East and Middle East; Africa; China; Japan; South Asia; early America to 1830; United States since 1815; Latin America; history and philosophy of science; and history of international relations since 1871. Topical fields may also be arranged with the consent of the graduate advisers.

Admission. To be considered for the Ph.D. program, a student must have an average of 4.5 in previous graduate studies. A student who has done work in a recognized institution without receiving a degree may petition for credit toward an advanced degree by passing examinations in his work. Results of the Graduate Record Examination Aptitude Test should accompany applications for admission. Undergraduate language preparation, especially in French, German or Russian, is important; for ancient, medieval and Renaissance history, some knowledge of Greek or Latin is essential; Spanish is required for certain fields of European and Latin American history.

Master of Arts. Candidates are expected to take at least two units in each of two of the fields of specialization listed above. A minimum of eight units is required, four of which must be at the 400 level, but excluding 496, 498 or 499's. Included must

be at least one research seminar with a grade of B or better. Students may elect to write a master's thesis, but the thesis does not replace the seminar requirement and may carry no more than three units of credit. A candidate must demonstrate ability to read one foreign language related to his field of interest as approved by the graduate advisers.

Doctor of Philosophy. A candidate for the Ph.D. needs a minimum of sixteen units beyond the master's degree. Eight of these units may be thesis research credit, but three 400-level research seminars are normally required, if not taken in the master's program here. Students should take a total of at least seven courses at the 400 level, not including the history of historiography (496), problems in the teaching of college history (498), and thesis research credit (499), which are also required. A candidate must demonstrate ability to read two foreign languages related to his field of interest as approved by the graduate advisers. In certain circumstances, a student may substitute a skill represented by specific advanced sources involving quantification for the second language. For the preliminary examination, the candidate must offer at least three fields in history, to be chosen from the specializations listed above, with no more than two in the same geographic area and at least one in a period prior to 1815. A student offering more than three fields may offer as major or minor field an approved topical specialization such as European Economic History, American Intellectual History, or English Constitutional History. Of the total sixteen (or more) units, a minimum of twelve must be taken in history. Candidates interested in specializing in American culture may elect a major in American history, with a first minor of three units in American literature and a second minor of two units in the history of fine arts in the United States.

HORTICULTURE

Head of the Department: C. J. Birkeland
Correspondence and Information: Department of Horticulture, University of Illinois at Urbana-Champaign, 124 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: C. R. Arnold, C. J. Birkeland, J. R. Culbert, D. F. Dayton, D. B. Dickinson, J. B. Gartner, E. R. Jaycox, R. K. Simons, W. E. Splittstoesser, J. S. Titus, J. S. Vandemark, C. C. Zych
Associate Professors: H. J. Hopen, M. M. Meyer, C. A. Rebeiz, A. M. Rhodes

Graduate Programs. Graduate work is offered in the Department of Horticulture leading to the Master of Science and Doctor of Philosophy degrees. Students may specialize in phases of horticulture which include production, breeding, and genetics; physiology; ecology; weeds and their control; developmental anatomy; marketing; or agriculture. In addition to advanced courses in horticulture, students may take courses in agronomy (crops, soils), botany, food science, genetics, statistics, plant pathology, chemistry, biochemistry, biophysics, entomology, or agricultural economics. Students may minor in any of these fields.

Master of Science. A minimum of eight units of which at least three 400-level units must be earned. This can be completed by a full-time student in an academic year. A written thesis is optional but all candidates must pass a final oral examination covering the major and minor areas of specialization.

Doctor of Philosophy. The candidate must complete eight units of course work beyond the master's degree and pass a preliminary examination. The candidate must also complete eight units of thesis research and submit an acceptable thesis. Competence in a foreign language may be required, depending on the area of special-

ization and recommendations of the student's advisory committee. Students specializing in plant physiology or genetics may elect to receive their degree in biology by satisfying the specific requirements of that program. See page 102.

HUMAN RESOURCES AND FAMILY STUDIES

Director of School: PAULINE C. PAUL
Correspondence and Information: School of Human Resources and Family Studies, University of Illinois at Urbana-Champaign, 260 Bevier Hall, Urbana, Illinois 61801

FACULTY

Professors: M. M. DUNSING, B. E. HASKELL, Q. B. MILLS, P. C. PAUL, R. B. SMITH, F. O. VAN DUYNE
Associate Professors: H. H. ALEXANDER, K. A. ANSPACH, E. L. BROWN, J. L. HAFSTROM, C. MCKENNA, F. E. WEBB
Assistant Professors: J. H. ANDERSON, R. R. BELL, R. P. JOHNSON, B. P. KLEIN, F. M. LAFONT, B. J. PETERSON, M. F. PICCIANO, S. B. SALAMON, M. K. WEIR

Graduate Programs. The School of Human Resources and Family Studies offers work leading to the Master of Science or Master of Arts in Home Economics, Master of Science in Home Economics Education, and Doctor of Philosophy in Home Economics with majors in family and comsumption economics and in foods and nutrition.

Admission. Undergraduate course requirements for admission depend on the area of specialization selected for graduate work.

Financial aid is available for a limited number of students in the form of fellowships, assistantships, and waivers of tuition and fees.

Master of Arts and Master of Science. The major for a master's degree in home economics may be in one of five curricula. Candidates must complete a minimum of eight units (nine if a thesis is not submitted) of which at least four must be in home economics. Four of the total units, including at least two in home economics, must be in 400-level courses. Programs are available in child development and family relationships; family and consumption economics; foods and nutrition; general home economics; and textiles and clothing. In addition, family and consumption economics requires two units of economics theory; foods and nutrition requires biochemistry. General home economics requires courses in three of the other four areas of specialization in home economics.

Master of Science in Home Economics Education. Candidates must earn eight units, four of them in home economics. Three of the eight units must be at the 400 level and at least one of these must be in home economics. Two units are required in foundation courses in general education and two units are required in home economics education.

Doctor of Philosophy. For a major in family and consumption economics required courses include four units of family and consumption economics, two at the 400 level; two units of economic theory (400 level); two additional units of economics and/or agricultural economics (400 level); two units of anthropology, psychology, and/or sociology, or one unit in these areas and one in family relationships; and one unit of applied statistics. Economics must be chosen as a minor field either as a sole minor or in combination with an area such as agricultural economics, anthropology, sociology, closely related areas in home economics, or an area involving international programs.

For a major in foods and nutrition, required courses include at least three units of foods and nutrition, two at the 400 level; one unit of statistical methods

at the 400 level; courses in biochemistry and physical chemistry; and an advanced course in food microbiology or mammalian physiology. Additional courses in the above areas or in animal nutrition or food science are selected to satisfy major requirements. Candidates may minor in animal nutrition, biochemistry, food science, microbiology, physiology, or other appropriate areas.

JOURNALISM

Head of the Department and Director of Graduate Study: JAY JENSEN
Correspondence and Information: Department of Journalism, University of Illinois at Urbana-Champaign, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: J. CAREY, J. JENSEN, H. MACLAY, T. PETERSON, J. SCHACHT
Associate Professors: G. GILMORE, T. GUBACK, G. HANSON, R. HILDWEIN
Assistant Professors: C. CHRISTIANS, J. ERICKSON, A. KREILING, L. SLOVONSKY

Graduate Program. The Department of Journalism offers graduate work leading to the Master of Science in Journalism. The department does not offer a Ph.D. degree. For the program leading to the Doctor of Philosophy in Communications, see page 67.

Master of Science. Requirements for the master's degree include the following: (1) A major of four units, or three units and one additional unit approved by the department. Candidates without undergraduate work in journalism or equivalent professional experience are required to complete one unit of news editing, two units in writing, and one unit in graphics and photojournalism. (2) A minor of at least two units, normally in an area outside the College of Communications. (3) A thesis of one unit, or preparation of a topic in journalistic form for publication or broadcast, for one unit. Students also have the option of doing both. (4) A minimum of three units in courses at the 400 level, at least two of which must be in journalism. (5) A written report on the current master's reading list. (6) A minimum total of eight units with a grade-point average not lower than 3.875.

LABOR AND INDUSTRIAL RELATIONS

Director of the Institute: M. ROTHBAUM
Correspondence and Information: Institute of Labor and Industrial Relations, University of Illinois at Urbana-Champaign, 504 East Armory Avenue, Champaign, Illinois 61820

FACULTY

Professors: M. DERBER, H. FOLK, W. FORM, W. H. FRANKE, P. L. GARMAN, P. T. HARTMAN, C. L. HULIN, B. KARSH, M. ROTHBAUM, K. TAIRA, H. C. TRIANDIS, M. WAGNER
Associate Professors: G. B. GRAEN, J. SCOVILLE
Assistant Professors: P. GERHART, J. KIMBERLY, W. HENDRICKS

Graduate Programs. The Institute of Labor and Industrial Relations offers a Master of Arts and a Doctor of Philosophy. Graduate instruction is offered in trade union, public employee, and management organization; in the accommodation of these organizations through the process and structure of collective bargaining; in personnel administration and employee relations; in manpower and human resources programs and policy; in the role of the government in legislating labor standards and labor relations; in the formulation of public policy; and in comparative and international

industrial relations. These matters are studied in the context of social, economic, and political change and are analyzed with the help of theoretical and empirical formulations of economics, history, law, political science, psychology, and sociology.

Admission. Students seeking admission to the master's program must meet the general entrance requirements of the Graduate College. In addition, an institute faculty committee reviews the undergraduate record of every candidate and may refuse admission to a student whose record indicates inadequate preparation. A course in statistics is the only prerequisite for admission, although course work in the various social sciences is desirable preparation for the institute program.

Admission to the Ph.D. program is granted only to those students whose undergraduate and graduate records indicate that they are likely to successfully complete the requirements for the Ph.D. Admission requirements are a master's degree or equivalent in labor and industrial relations or an allied field, a master's thesis or similar evidence of research competence, and three letters of recommendation. Prerequisites are courses in labor problems and statistics; college algebra and first-year calculus are recommended.

Master of Arts. Candidates have a choice of study programs. Program A requires eight units of graduate credit, two of which are granted for successful completion of a thesis. Program B requires ten units of course work. Common requirements in both programs include one unit of credit in research methods, one unit of credit in quantitative analysis, responsibility for a list of required readings, and a comprehensive oral examination.

Doctor of Philosophy. The candidate's course work is concentrated in two or more social science disciplines related to a selected area of specialization. A minimum of sixteen units of course work beyond the baccalaureate must include three units of research methodology, three units in industrial relations theory, and ten units in the area of specialization with courses in at least two disciplines. Each candidate will take a two-part preliminary examination: (1) a written examination in the theory of labor and industrial relations and either a written examination in the area of specialization or the submission of two papers or articles of potentially publishable quality, and (2) an oral examination on the candidate's dissertation proposal. The Institute has no foreign language requirements except for candidates who elect to work in fields that require such competence.

LANDSCAPE ARCHITECTURE

Head of the Department: Robert B. Riley
Coordinator of the Graduate Program: Albert J. Rutledge
Correspondence and Information: Coordinator of the Graduate Program, Department of Landscape Architecture, University of Illinois at Urbana-Champaign, 205 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: W. M. Keith, R. B. Riley, D. L. Slotnick
Associate Professors: A. J. Rutledge, D. L. Walker, Jr., R. W. Zolomij
Assistant Professors: L. D. Hopkins, M. H. Lindemann, J. A. Nelson, J. W. Taylor, T. C. Wang, E. S. Weidemann, D. C. Wilkin

Graduate Program. The Department of Landscape Architecture offers work leading to the Master of Landscape Architecture. The program is designed to enable students to gain fresh insights and experiment with new applications pertaining to land and its use by people. Before submitting an application, students should secure a pamphlet from the department which describes the specific areas of study and the time needed to complete the requirements.

Admission. Students are admitted on an individual basis according to a review of their prior accomplishments with an emphasis on academic achievement. Candidates from undergraduate design programs must accompany applications with samples of their design work.

Degree Requirements. A student must complete a minimum of twelve units comprising at least six units taken within the department and at least three units chosen from courses offered outside the department and maintain a 4.00 average for all courses taken. Specific courses are determined in consultation with an adviser to meet the needs of the student's selected area of study.

LATIN AMERICAN AND CARIBBEAN STUDIES

Director of the Center for Latin American and Caribbean Studies: MERLIN H. FORSTER
Correspondence and Information: Center for Latin American and Caribbean Studies, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: W. BAER, W. BLAYLOCK, J. CASAGRANDE, C. DEAL, F. DOVRING, F. FLIEGEL, R. FINDLEY, M. FORSTER, J. HILL, D. LATHRAP, L. LEAL, A. PASQUARIELLO, E. RAE, S. SCHMIDT, R. SCOTT, J. THOMPSON, N. WHITTEN, R. ZUIDEMA
Associate Professors: A. AIEX, D. BUTTERWORTH, M. FRANCESCATO, D. GROVE, S. KRONUS, J. LOVE, T. MEEHAN, R. PRETO-RODAS, M. SALTARELLI, M. SOLAUN, H. TRUEBA, J. VAN ES
Assistant Professors: A. AZEVEDO, P. DRAKE, R. PELCZAR, J. STEWART

Graduate Programs. Graduate minors in Latin Amercian and Caribbean studies are administered by the director of the Center for Latin American and Caribbean Studies.

Candidates for the master's degree who elect a minor in Latin Amercian and Caribbean studies must complete two units from the courses prescribed by the center. Doctoral candidates who elect a minor in this area must complete four units for a sole minor, or two units for a split minor. Courses must be taken in at least two departments; lists of courses fulfilling the minor are available from the center.

Students in technical and professional colleges and schools of the University who seek knowledge of Latin American and Caribbean affairs, culture, and languages are invited to consult with the director of the center, or with their advisers, in order to develop programs suited to their individual needs. Such a program may often be adopted as a special minor under existing regulations if the student so desires. These courses are of particular value to students who intend to carry on technical or professional work in the Latin American and Caribbean area for the government, private business, publications, or religious organizations.

LAW

Dean of the College of Law: JOHN E. CRIBBET
Associate Dean: PETER HAY
Director of Graduate and International Legal Studies: RALPH REISNER
Correspondence and Information: College of Law, University of Illinois at Urbana-Champaign, 209 Law Building, Champaign, Illinois 61820

FACULTY

Professors: M. W. Benfield, R. G. Cohn, J. J. Costonis, J. E. Cribbet, R. W. Findley, G. T. Frampton, W. D. Hawkland, P. H. Hay, E. F. Hess, C. Kim, H. D. Krause, W. R. LaFave, P. B. Maggs, J. H. McCord, T. D. Morgan, J. O'Connell, W. Painter, S. J. Plager, C. W. Qick, R. Reisner, R. Simon, V. J. Stone, J. N. Young
Associate Professors: M. S. Graham, J. E. Nowak
Assistant Professors: M. L. Fellows, K. T. Lopatka, P. Marcus, S. C. Moriearty, R. D. Rotunda, E. W. Shoben
Lecturers: H. A. Baker, S. M. Mamer, G. Miller

Graduate Programs. The College of Law offers a program of graduate work leading to the Master of Laws, Master of Comparative Law, and Doctor of the Science of Law.

Master of Comparative Law. A student whose undergraduate study in law has been in systems based on the Anglo-American common law is eligible to apply for candidacy for the Master of Laws or Doctor of the Science of Law. A foreign lawyer whose prior law study has been in a system which is not based on the Anglo-American common law may, in exceptional cases, be admitted to candidacy for the Master of Laws or Doctor of the Science of Law, or such foreign lawyer may apply for candidacy for the Master of Comparative Law. The Master of Comparative Law program is designed to develop facility in the comparative method and to prepare a foreign lawyer to deal knowledgeably with Anglo-American problems. Admission standards, as well as residency, course grade average, and other requirements, except for a thesis, are substantially the same as for the LL.M. and J.S.C. programs.

Master of Laws and Doctor of the Science of Law. For admission, an applicant must have received a first degree in law from a law school which has graduation requirements substantially the same as the University of Illinois College of Law and must present evidence of ability to do satisfactory work at the graduate level. A candidate for the Master of Laws must have a grade-point average of at least 4.0 in all law work previously undertaken. A student who is a candidate for the degree of Doctor of the Science of Law is normally required to have a grade-point average of 4.0 in all law work previously undertaken, and also to present evidence of the ability to do independent research; the latter requirement may be met by the submission of satisfactory legal writing done while the applicant was a candidate for the Juris Doctor (or equivalent degree), or subsequent to the receipt of that degree.

One academic year in residence is required of a candidate for an advanced degree. The programs for the LL.M. and J.S.D. degrees consist of course work and research which have been approved by the committee on graduate study of the College of Law, comprising at least eight units of graduate work of which at least two for the master's degree and four for the doctor's degree must be in research. In addition to the course work and research, a thesis is required. For the master's degree, the thesis may be completed during the year in residence. For the doctor's degree, the thesis must be submitted not less than one year nor more than five years after the completion of the residence requirements, and the candidate must pass an oral examination before a committee of the faculty. The program for the Master of Comparative Law consists entirely of course work and must include satisfactory completion of Law 402 (Introduction to U.S. Law). The candidate for the Master of Laws or the Master of Comparative Law degrees must secure a grade-point average of 3.5 in graduate or professional law courses; the candidate for the Doctor of Science of Law, an average of 4.0.

Financial Aid. The College of Law offers seven teaching assistantships to students whose backgrounds have been in the Anglo-American common law system and four teaching assistantships for students with backgrounds in other legal systems. In addition, a limited number of fellowships and waivers of tuition and fees is available. All types of financial aid enable students to complete the degree requirements within the regular time limits. Because of the keen competition for the few available financial grants, application for these should be made as early as possible, preferably by January 1.

LAW AND SOCIETY

Correspondence and Information: Rita J. Simon, Program in Law and Society, University of Illinois at Urbana-Champaign, 318 Lincoln Hall, Urbana, Illinois 61801

The relationships between law and society are of considerable interest to many students who may wish to focus a part of their programs of study in this area. The Program in Law and Society, in cooperation with faculty members of the departments of Law, Political Science, Psychology, Social Work, Sociology, and Urban and Regional Planning, regularly offers seminars to faculty, graduate students, and other interested scholars.

LEISURE STUDIES

Head of the Department: JOSEPH J. BANNON
Correspondence and Information: Michael G. Wade, Director of Graduate Studies, Department of Leisure Studies, University of Illinois at Urbana-Champaign, 104 Huff Gymnasium, Champaign, Illinois 61820

FACULTY

Professors: J. J. BANNON, A. V. SAPORA
Associate Professors: R. J. BURDGE, J. R. KELLY, M. G. WADE
Assistant Professors: J. E. CHRISTENSEN, R. P. CRANDALL, S. L. GUNN, G. A. LOWREY, JR., G. C. ROBERTS

Graduate Programs. The Department of Leisure Studies offers programs of study leading to the Master of Science and the Doctor of Philosophy degrees. The Master of Science program prepares supervisors and administrators for public parks and recreation systems, treatment centers for the ill and handicapped, and various private and semi-public settings providing leisure services, or may serve as the first step toward the Ph.D. program. The Ph.D. program is, in general, designed to train teacher-scholars and research personnel in the study of leisure behavior or the management of leisure service delivery systems or both.

Admission. The departmental graduate committee strives to select those students with maturity and experience who show real promise of being academically and professionally productive. The previous degree field is of importance, and preference is given to those with a solid array of undergraduate courses in recreation or a master's degree in the field. Preference is also given to full-time students who will be active degree candidates.

Applicants must submit three letters of reference, all transcripts, Miller Analogies Test score, Graduate Record Examination scores, and a completed personal history and professional experience form. Students whose undergradate training is deficient in one or more areas may be admitted with deficiencies which must be removed during the first year of graduate study.

Students in the department seeking admission to the Ph.D. program must apply formally and will be considered in competition with applicants who are taking the master's degree elsewhere. They must have an admission average of 4.0 for the last sixty hours of undergraduate work and previous graduate study, satisfactory scores on both the Miller Analogies Test and the Graduate Record Examination, and successful experience in the field. Candidates are required to have a personal interview with the head of the department or a representative.

Master of Science. A candidate for the M.S. degree must spend at least one semester on campus, and complete a minimum of eight units, three of which must be in the 400

series. Four of these units should be in the area of specialization. A thesis may be written for two units. Those waiving the thesis are required to take and pass a final comprehensive written examination. A full-time student can complete this program in one calendar year.

Doctor of Philosophy. A candidate for the Ph.D. must spend at least two years in residence and satisfactorily complete sixteen units beyond the master's degree. These units include the Ph.D. dissertation. Two languages are required, but may be waived provided two additional units of course work are substituted for each language. Graduate examinations include written preliminary examinations taken at the completion of formal course work, oral preliminary examinations on proposed research of the thesis, and a final examination in defense of the doctoral thesis.

LIBRARY SCIENCE

Director of the Graduate School of Library Science: H. GOLDHOR
Correspondence and Information: Graduate School of Library Science, University of Illinois at Urbana-Champaign, 329 Library, Urbana, Illinois 61801

FACULTY

Professors: G. S. BONN, H. GOLDHOR, D. W. KRUMMEL, F. W. LANCASTER, R. E. STEVENS, M. E. WILLIAMS
Associate Professors: W. C. ALLEN, J. L. DIVILBISS, K. L. HENDERSON, S. RICHARDSON, C. E. THOMASSEN, L. M. WERT
Assistant Professors: R. E. BROWN, S. FAIBISOFF
Lecturer: J. MILLER

Graduate Programs. The purpose of the Graduate School of Library Science is to prepare men and women for careers as professional librarians in all types of libraries. Programs of study may be followed leading to the Master of Science and Doctor of Philosophy in Library Science, Certificate of Advanced Study in Librarianship, and Doctor of Library Science.

Admission. In addition to the Graduate College requirements, applicants to all degree programs must submit scores on the Aptitude Test of the Graduate Record Examination taken within the last five years.

Master of Science. At least one summer and two semesters in residence, or the equivalent (ten units), are required to earn the master's degree. It is desirable for applicants to have some library work experience and two years of college-level study of any foreign language. Each student's program of study, adapted to his particular needs and purposes, is planned in consultation with a faculty adviser.

Certificate of Advanced Study. This program is open to those who hold a master's degree in librarianship from an accredited library school and who have a minimum of two years of acceptable professional library experience since receiving the degree. Applicants for this degree must have maintained a grade-point average of at least 4.0 in the master's program. The certificate is awarded upon the successful completion of eight units of graduate course work. Of the eight units, at least half must be in library science.

Doctor of Philosophy and Doctor of Library Science. Applicants to these programs must meet the following requirements: master's degree in library science from an accredited library school with a 4.0 grade-point average, two years of acceptable full-time library work experience since receipt of the master's degree (exceptions may be made in this requirement), letters of recommendation from three people (including a library work supervisor), and an interview with two or more members of the doctoral committee of the faculty. It takes a doctoral student at least three years of full-time study to earn the degree. Preference is given to those applicants for admission who

expect to stay in the program continuously until they finish. In no case may a candidate have more than seven years in which to earn a doctorate.

LIFE SCIENCES

(Including Botany; Ecology, Ethology, and Evolution; Entomology; Genetics and Development; Microbiology; and Physiology and Biophysics)

Correspondence and Information: School of Life Sciences, University of Illinois at Urbana-Champaign, 387 Morrill Hall, Urbana, Illinois 61801

Graduate Programs. The School of Life Sciences includes the departments of Botany; Ecology, Ethology, and Evolution; Entomology; Genetics and Development; Microbiology; and Physiology and Biophysics. Study programs leading to the graduate degrees of Master of Science and Doctor of Philosophy exists in each of the departments and are described in detail in the following pages. Interdepartmental study programs leading to advanced degrees in cell biology and virology, environmental biology, neural and behavioral biology, and plant physiology are administered within the school. The school also participates with other departments of the University in offering the Ph.D. program in genetics. See page 87.

Support for graduate training is available in the form of teaching or research assistantships and University fellowships. Prospective students may obtain application forms and relevant information for departmental study programs from the executive officer of the appropriate department, or for interdepartmental study programs from the School of Life Sciences.

Interdepartmental Biology Programs

Executive Officer of Biology Programs: Larry N. Vanderhoef
Correspondence and Information: Biology Programs, 393 Morrill Hall, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801

Graduate Programs, Admission. Interdepartmental Biology Programs lead to advanced degrees in 1) cell biology and virology, 2) ecology, 3) neural and behavioral biology, and 4) plant physiology. Biology programs also participate in the administration of the Ph.D. program in genetics (see page 87). Additionally, two M.S. programs (M.S. in Biology, M.S. in Teaching of Biological Sciences and General Science) are offered. Graduate Record Examination scores are required for all Ph.D. programs, and the M.S. in Teaching of Biological and General Science. Additionally, all applicants must outline their educational objectives in a brief statement and must submit three letters of recommendation.

Master of Science in Teaching of Biological and General Science. This degree is intended for persons planning to enter the teaching profession or who presently are teaching biology or general science in junior high school, high school, or junior college. It is offered upon the completion of the fifth year in the teacher-education curriculum in biological and general science or upon completion of eight units of advanced credit (outlined below) and certification. For admission to this program, students must have an admission average of at least 4.0. Additionally, Graduate Record Examination Scores must be submitted.

Candidates for the Master of Science in the Teaching of the Biological Sciences and General Science must earn four units in biological sciences, two units in education (see page 35), and two units in electives. Electives may be in the biological sciences, education or in exceptional cases, other fields. A course in biological chemistry is strongly advised. Students who are preparing for high school teaching and who are not yet certified must fulfill state certification requirements.

Master of Science in Biology. This program is intended to be designed by the student in consultation with an appropriate adviser. While general training in biology is encouraged, concentration in any area of biology is possible as well; however, students intending to concentrate in botany, entomology, microbiology, animal physiology or biophysics should apply directly to the appropriate School of Life Sciences departmental graduate program. Admission requires an admission average of at least 4.00. Although no specific undergraduate courses are required for admission to this curriculum, a minimum of a year of physics with laboratory, a course in organic chemistry with laboratory, and a semester of calculus must be completed before a degree is granted. Of the eight units required for the degree, at least three units must be taken in 400-level courses. A thesis is not required, but a research report covering at least one unit of individual problem work must be completed. A comprehensive examination may be required of all candidates.

Doctor of Philosophy in Biology. The School of Life Sciences offers the doctorate in several interdepartmental areas: cell biology and virology, ecology, neural and behavioral biology, and plant physiology. Entrance requirements in addition to those listed for the Master of Science include background training in general biology, physics, biochemistry, and calculus; deficiencies in these areas may be remedied during the first year of graduate study. Programs are designed to suit individual needs in consultation with advisers. Students who have been accepted for one of these programs may select any faculty member in the School of Life Sciences, or an appropriate member of a cooperating department as a major adviser. Additional information may be obtained from the School of Life Sciences. Descriptions of these area doctoral programs are given below.

Cell Biology and Virology. The cell biology and virology program emphasizes molecular mechanisms and is therefore addressed to students who have acquired or wish to acquire a strong background in chemistry. Areas of research open to students in this program include cytochemistry, biochemistry of subcellular systems, cellular differentiation, intercellular regulation of meiosis and mitosis, circadian rhythms, cellular genetics, and virology.

Ecology. The ecology program is an interdepartmental approach to the study of the basic interrelationships between organisms and their environment, and the structure and the function of ecosystems. Areas of specialization include physiological, population, community, systems, and evolutionary ecology.

Ecology, Ethology and Evolution. See Page 103.

Genetics and Development. See Page 105.

Neural and Behavioral Biology. This is a multidisciplinary program with staff members from physiology, psychology, biochemistry, ethology, and biophysics. Research areas include neurochemistry, animal behavior, cybernetics, comparative and mammalian central nervous physiology, cellular neurobiology, and physiological psychology.

Plant Physiology. Plant physiology, an interdepartmental area of specialization, is staffed by plant physiologists from five plant science departments: agronomy, botany, forestry, horticulture, and plant pathology. Thesis research can be conducted in any of these departments. Areas of research include photosynthesis, respiration, membrane transport, nitrogen metabolism, hormones and nucleic acids, herbicide action, water relations, and environmental physiology. In addition to plant physiology, students are required to complete courses in biochemistry and physical chemistry.

Botany

Head of the Department: John B. Hanson
Associate Head: John S. Boyer
Correspondence and Information: Associate Head of the Department of Botany, University of Illinois at Urbana-Champaign, 289 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: J. S. Boyer, J. M. J. deWet, D. B. Dickinson, Govindjee, C. H. Grunwald, J. B. Hanson, L. R. Hoffman, T. L. Phillips, D. P. Rogers, R. W. Tuveson
Associate Professors: C. J. Arntzen, F. A. Bazzaz, Z. B. Carothers, A. W. Haney, F. Meins, Jr., M. L. Sargent, L. N. Vanderhoef
Assistant Professors: D. S. Seigler, C. A. Shearer, C. A. Wraight

Graduate Programs. The Department of Botany offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. It also participates in interdepartmental study programs leading to doctoral degrees in cell biology and virology, ecology, genetics, and plant physiology.

Areas of specialization available within the department include: anatomy, cytology, development, ecology, genetics, mycology, paleobotany, photosynthesis, phycology, physiology, systematics, and virology. Graduate students are expected to acquire reasonable breadth in their botanical backgrounds as well as depth in their areas of specialization. A knowledge of the principles of ecology, genetics, morphology, physiology, and systematics is strongly recommended.

Admission. All applicants for admission are considered on an individual basis. While departmental requirements do not specify particular courses as prerequisites for admission, applicants should have had some undergraduate training in botany or biology and related sciences. Graduate Record Examination scores are required.

Master of Science. Candidates for the M.S. are expected to fulfill the requirements of the Graduate College, and to broaden and deepen their training in a program of course work and research agreed upon with a faculty adviser. A thesis may be required at the option of the candidate's adviser.

Doctor of Philosophy. Candidates for the doctorate are expected to fulfill the requirements of the Graduate College in a program of course work and research under the supervision of a faculty adviser.

In addition to the requirements of the Graduate College, the department requires that students with the M.S. degree, or those nearing completion of the first eight units of graduate study, or, in any case, those nearing the end of the first two years of graduate study must obtain department approval before continuing further toward the Ph.D. degree. During the first year after approval, the student must meet with the interview committee, which makes recommendations on the content of the student's graduate program. The department requires a minimum of one foreign language to be completed prior to the preliminary examination, usually chosen from French, German, Latin, Russian, or Spanish. More than one foreign language may be required at the option of the adviser.

Ecology, Ethology, and Evolution

Acting Head of the Department: E. M. Banks
Correspondence and Information: Department of Ecology, Ethology, and Evolution, University of Illinois at Urbana-Champaign, 515 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: E. M. Banks, L. L. Getz, A. W. Ghent, D. F. Hoffmeister
Associate Professors: T. H. Frazzetta, J. R. Karr, G. H. Kieffer, M. R. Lee, M. Salmon, D. C. Sweeney, M. F. Willson
Assistant Professors: H. W. Ambrose III, G. O. Batzli, C. S. Carter-Porges, R. M. Fagen

Graduate Programs. The Department of Ecology, Ethology, and Evolution administers graduate degree programs as areas of specialization in Biology. Areas of training include ethology, functional anatomy, physiological mechanisms of behavior, evolutionary community and population ecology, biogeography, quantitative analysis of behavioral and ecological systems, resource management, behavior-genetics, karyotype analysis, systematics and taxonomy.

Admission. Acceptance for graduate study in Ecology, Ethology, and Evolution is based on the applicant's research potential and academic achievement. An undergraduate degree in the life sciences is the usual preparation, but students majoring in mathematics, computer science, physical and social sciences are also considered. Courses required for admission are inorganic and organic chemistry, biochemistry, and a year of physics and mathematics through calculus. Students lacking one or more of these courses may be admitted with the provision that such deficiencies be completed in addition to the normal graduate course load. A grade-point average of at least 4.0 (=B) for the last sixty hours of undergraduate work, in addition to any graduate study, is mandatory and high scores on the Graduate Records Examination are necessary. Considerable emphasis is placed on a student's interest and ability in research as demonstrated by previous work and letters of recommendation.

Master of Science. With approval of the M.S. Biology Committee, students in Ecology, Ethology, and Evolution may pursue a M.S. degree in Biology under the supervision of a departmental adviser. See Master of Science in Biology, page 101.

Doctor of Philosophy in Biology: Ecology, Ethology, and Evolution Area of Specialization. Candidates for the Ph.D. must demonstrate excellence in the three departmental areas and, in consultation with an adviser and doctoral committee, plan and carry out original thesis research with distinction. A Qualifying Examination covering general knowledge is given early in the student's program and a Preliminary Examination, assessing the feasibility and significance of the thesis research, is taken as the student begins thesis work. Courses in both statistics and computer science are required and proficiency in one or more foreign languages may be required depending on the field of research. Additional requirements are individually prescribed by the adviser and doctoral committee. A Final Examination in which the student defends the thesis and presentation of the thesis at a departmental seminar completes the program. See page 108.

Entomology

Head of the Department: Stanley Friedman

Correspondence and Information: Admissions Committee, Department of Entomology, University of Illinois at Urbana-Champaign, 320 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: G. Fraenkel, S. Friedman, A. W. Ghent, W. R. Horsfall, E. R. Jaycox, W. E. LaBerge, J. R. Larsen, W. H. Luckmann, R. L. Metcalf, R. B. Selander, L. J. Stannard, J. G. Sternburg, G. P. Waldbauer

Associate Professors: E. G. MacLeod, P. W. Price, J. H. Willis

Assistant Professors: F. Celcomyn, H. Hummel

Graduate Programs and Admission. The Department of Entomology offers graduate work leading to the Master of Science and Doctor of Philosophy. Previous training in entomology is not necessary. It is recommended that students who intend to study for advanced degrees in entomology gain a thorough grounding in the physical and biological sciences, mathematics, and the liberal arts.

Master of Science. A candidate for the M.S. is expected to become knowledgeable in entomology through course and field work and to complete a research thesis in an area of interest arrived at in consultation with an adviser. The graduate average required for degree certification is 4.0.

Doctor of Philosophy. A candidate for the Ph.D. must master the general areas of entomology (bionomics, control, morphology, physiology, and taxonomy) and demonstrate professional competence in a specialized area by presenting an acceptable thesis based on original research. Reading proficiency in a foreign language of importance to the area of research, ordinarily German or Russian is also required. The graduate average required for degree certification is 4.0.

Genetics and Development

Acting Head of the Department: E. H. Brown
Correspondence and Information: Department of Genetics and Development, University of Illinois at Urbana-Champaign, 515 Morrill Hall, Urbana, Illinois 61801

FACULTY

Professors: F. J. Kruidenier, J. R. Laughnan, D. L. Nanney, R. B. Selander, D. M. Steffensen, R. W. Tuveson, R. L. Watterson, C. R. Woese
Associate Professors: N. E. Alger, E. H. Brown, R. Davenport, E. G. MacLeod, R. MacLeod, F. Meins, M. L. Sargent, D. L. Stocum, G. S. Whitt, J. H. Willis
Assistant Professors: W. L. Daniel, R. P. Futrelle, L. R. Maxson, W. W. M. Steiner

Graduate Programs. The Department of Genetics and Development offers graduate work in the Genetics and Development area of specialization leading to the Doctor of Philosophy in Biology. This program offers interdisciplinary training in genetics, developmental biology, and cell biology over many levels of biological organization and in many organisms. Major areas of research open to students in this program are: (1) biochemical, cellular, and population (evolutionary) genetics; (2) developmental regulation and differentiation; and (3) the application of genetics to problems in development and cell biology.

Admission. Applicants for the Genetics and Development area of specialization are evaluated on the basis of their educational background, grade-point average (which must be at least 4.0 = B), Graduate Record Examination scores (which should be at least in the 60th percentile), and letters of recommendation. Applicants should have completed courses in physics, organic chemistry, biochemistry, calculus, statistics, and a foreign language, and have had a broad training in the biological sciences. Applicants who have received an M.S. degree must meet these same requirements and must have at least a 4.0 grade-point average for non-thesis courses which applied toward the M.S. degree.

Doctor of Philosophy in Biology: Genetics and Development Area of Specialization. Candidates design a suitable program of study in consultation with a faculty adviser and an advisory committee. The program must include at least six units of formal course work pertaining to the student's area of interest, with at least one course each in the areas of cell biology, genetics, and development. Participation in an appropriate seminar course for at least two semesters and reading proficiency in a foreign language (usually French, German or Russian) are also required. Each student must pass (1) a written qualifying examination intended to ascertain the candidates' breadth of training, the competence in his or her specialty, and abilities to integrate knowledge and communicate in writing, (2) an oral preliminary examination intended to ascertain the student's ability to carry out independent research, and (3) an oral thesis examination at which the student discusses and defends his or her dissertation. See page 108.

Microbiology

Head of the Department: R. D. DeMoss
Correspondence and Information: Department of Microbiology, University of Illinois, Urbana-Champaign, 131 Burrill Hall, Urbana, Illinois 61801

FACULTY

Professors: M. P. Bryant, R. D. DeMoss, J. W. Drake, R. E. Kallio, S. Kaplan, R. C. Meyer, Z. J. Ordal, M. E. Reichmann, D. C. Savage, E. W. Voss, C. R. Woese, R. S. Wolfe
Associate Professors: J. Konisky, J. T. Wachsman, M. J. Weber
Assistant Professors: D. D. Burke, P. L. Carl, M. G. Gabridge, A. C. Helm, C. L. Hershberger, S. J. Kaufman, P. K. Y. Wong

Graduate Programs. The Department of Microbiology offers graduate work leading to the Master of Science and Doctor of Philosophy. For both degrees, the program provides a strong basic background in microbiology, biochemistry, and genetics. Students completing the program are qualified for positions in academic, industrial, or governmental environments and particularly for further specialization in a chosen subarea of microbiology and related disciplines.

Major areas of research interest are: microbial, viral, and molecular genetics; molecular biology; viruses; enzyme localization; enzyme structure and function; immunology; immunochemistry; pathogenic microbiology, rumen microbiology, intestinal microbiology, biochemistry of anaerobic bacteria; mechanisms of pathogenesis; metabolic control; and animal cell culture.

The departmental requirement of a foreign language for the Ph.D. degree may be satisfied by 1) four years of one language at the high school level, or 2) two years of one language at the undergraduate level, or 3) completion of the 401 language course with a grade of B or better, or 4) earning a passing grade on the Princeton foreign language exam. A foreign language is not required for the M.S. degree.

Admission. Students electing microbiology as a major for an advanced degree should have had, in addition to formal training in general biology or microbiology, chemistry through quantitative analysis and organic chemistry, and fifteen hours of physical or biological sciences. Mathematics through calculus is strongly recommended.

Master of Science and Doctor of Philosophy. Candidates for graduate degrees design their programs of study in consultation with individually assigned faculty committees. Study programs are flexible and are dependent upon the experience, interests, and goals of each student.

Cell Biology, Genetics, and Molecular Biology. Candidates in interdisciplinary graduate programs may, with the approval of the appropriate program committee, select certain departmental faculty as research advisers.

Specialization in Molecular Biology. The Department of Microbiology offers an area of specialization in molecular biology. The program is flexible and provides the doctoral candidate with basic training in biology and physical biochemistry. Students electing this area should possess a solid background in physics and mathematics. Details of the curriculum are decided individually, on the basis of the past experience and interests of the students.

Physiology and Biophysics

Head of the Department: William W. Sleator
Correspondence and Information: Department of Physiology and Biophysics, University of Illinois at Urbana-Champaign, 524 Burrill Hall, Urbana, Illinois 61801

FACULTY

Professors: H. W. Ades, J. D. Anderson, L. Barr, D. E. Buetow, E. Donchin, H. S. Ducoff, F. Dunn, C. Gianturco, Govindjee, J. E. Heath, J. R. Larsen, A. V. Nalbandov, C. L. Prosser, V. D. Ramirez, W. W. Sleator, H. I. Teigler, A. R. Twardock, G. Weber, J. S. Willis, C. R. Woese

Associate Professors: J. A. Connor, T. G. Ebrey, S. I. Helman, C. H. Hockman, A. Kokko-Cunningham, E. Satinoff, S. G. Stolpe, D. C. Sweeney

Assistant Professors: J. M. Bahr, D. J. Barker, J. M. Barrett, D. Bieger, H. P. Cheng, J. C. Cooley, F. Delcomyn, R. B. Gennis, P. H. Hartline, E. G. Jakobsson, G. L. Jendrasiak, I. A. Johnston, B. S. Katzenellenbogen, B. W. Kemper, E. E. Kicliter, W. B. Rhoten, P. G. Schmidt, O. D. Sherwood, R. L. Terjung, C. A. Wraight, J. E. Zehr

Graduate Programs. The Master of Science and Doctor of Philosophy degrees are granted both in physiology and biophysics.

PHYSIOLOGY

Admission. Applicants for graduate study in physiology are screened by an admissions committee. Students should have a broad undergraduate training in physiology, general biology, a premedical course, or a major in chemistry or zoology. Most students admitted in the last two years have had a grade-point average between an A and B, and letters of recommendation indicating ability to perform graduate work. A limited number of fellowships and teaching or research assistantships are available for qualified students.

Master of Science. A master's degree requires eight or more units of graduate work drawn from the offerings of this and other departments. Each student must submit a report based on original research and pass an oral examination administered by the physiology qualifying committee.

Doctor of Philosophy. Every candidate for Ph.D. is required to obtain a firm background in the general areas of mammalian, comparative, and cellular physiology, as well as a high degree of expertise in an area of specialization. The student is also expected to develop proficiency in other appropriate disciplines, such as biochemistry, physical chemistry, statistics, and the history and philosophy of science. Normally each student is expected to gain a year of experience as a teaching assistant.

The preliminary examination is taken after completion of at least sixteen units of graduate course work, completion of all courses specified by the student's advisory committee, and after satisfying the foreign language requirement. A thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the branches of physiology must be presented to a review committee before the final examination.

BIOPHYSICS

Admission and Aid. The objective of the program in biophysics is to give students sufficient training in physics, chemistry, and biology to enable them to apply the conceptual, instrumental, and mathematical approaches of the physical scientist to the solution of biological problems. The curriculum is designed primarily for students entering with previous training in the physical sciences, but students with a background only in biology may be eligible. Admission requirements are one year of college biology, one year of college physics, chemistry through organic chemistry, and mathematics through calculus. In exceptional cases deficiencies can be corrected while in training. Applicants must have an admission average of at least 4.0. A limited number of fellowships and teaching or research assistantships are available for qualified students.

Master of Science. To obtain the Master of Science degree, the student must offer at least eight units in biophysics and related subjects including two biophysics core courses. A thesis or examination in a specialized field is also required.

Doctor of Philosophy. A flexible approach is made to curriculum requirements, but an acceptable course program usually includes the following: (1) Physical sciences; mathematics through differential equations; a one-year sequence in physical chemistry, biochemistry with laboratory, classical mechanics, electromagnetic field theory, and elementary quantum mechanics. (2) Biological sciences: three units of graduate course work in one of the major areas of biology, determined by the research interests of the student. (3) Biophysics: satisfactory completion of two biophysics core courses and two additional courses in biophysics (other than research). Other subjects may be taken with the approval of the faculty.

After completion of eight units of course work the student is required to take a qualifying examination for the purpose of diagnosing inadequacies in training. Successful completion of the preliminary examination after at least sixteen units of formal course work admits the student to candidacy for the degree of Doctor of Philosophy. Normally each student is expected to gain one semester of teaching experience. A thesis based on original work and demonstrating thorough knowledge of theory and techniques in one of the areas of biophysics must be presented to a review committee a suitable interval prior to the final examination.

Zoology

As of the printing of this catalogue, the Department of Zoology has been provisionally divided into the Department of Ecology, Ethology, and Evolution and the Department of Genetics and Development (q.v.). The proposal to remove this provisional status is in the final stages of approval.

LINGUISTICS

(Including Arabic, Modern and Biblical Hebrew, Hindi, Persian, Swahili, and Yoruba)

Head of the Department: Braj B. Kachru
Correspondence and Information: Department of Linguistics, University of Illinois at Urbana-Champaign, 4088 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: J. H. D. Allen, E. H. Antonsen, K. O. Aston, J. B. Casagrande, C. L. Dawson, B. B. Kachru, Y. Kachru, H. R. Kahane (emeritus), C-W. Kim, C. W. Kisseberth, F. K. Lehman, H. Maclay, J. W. Marchand, C. Osgood, I. Rauch, G. L. Tikku, W. R. Zemlin, L. Zgusta
Associate Professors: L. F. Bouton, C. C. Cheng, R. Dunatov, F. S. Gladney, G. M. Green, H. H. Hock, F. M. Jenkins, M. J. Kenstowicz, S. Makino, M. Saltarelli, D. Wanner
Assistant Professors: E. G. Bokamba, P. Cole, J. R. Cowan, W. B. Dickerson, J. Morgan

Graduate Programs. The Department of Linguistics offers graduate programs leading to the Master of Arts and Doctor of Philosophy. Work toward these degrees is divided into several specialized areas under the general division of historical, descriptive, theoretical, and applied linguistics; further specialization includes comparative linguistics, historical linguistics, African linguistics, East Asian linguistics, South Asian linguistics, Semitic linguistics, romance linguistics, articulatory and acoustic phonetics, psycholinguistics, mathematical and computational linguistics, sociolinguistics, and stylistics.

Admission. Undergraduate preparation for admission to the master's program in linguistics should include the equivalent of Linguistics courses 300, 301, and 302; at least three years of foreign language experience (familiarity with two foreign languages is recommended); and a broad background in the humanities, social sciences and mathematics.

Master of Arts in Theoretical or Applied Linguistics. The aim of the master's program is to instruct students in the important areas of linguistics and the methods of linguistic analysis. Candidates for this degree must earn eight units, including courses in syntax, phonology, history of linguistics, and an area of specialization. Those concentrating on the theoretical program are required to take 401, 402, 441, 442, and 340. The applied program requires 401, 402, 441 and/or 442, and 340. In addition, the student must pass a reading examination in French, German, or Russian (or any other language which the student's adviser considers important for the academic interests and research of the candidate), and pass the comprehensive qualifying examination. Admission to the qualifying examination is contingent upon success in the language examination.

Doctor of Philosophy in Theoretical and Applied Linguistics. Admission to candidacy for the Ph.D. normally requires an average of 4.5 or better for all graduate work in linguistics and distinction in passing the comprehensive qualifying examination. Candidates for this degree must complete at least twenty-four units of graduate work, or sixteen units beyond the master's degree. The minimum twenty-four units must include the course requirements listed above for the master's degree (or their equivalent), advanced courses as required for the area of specialization, and eight units of thesis research. Candidates must also demonstrate proficiency in a second language other than English. However, this second language requirement is made flexible depending on the research interest of the student. The candidate is required to take the preliminary examinations (written and oral) after completion of eight units beyond the master's level. Students are encouraged to attend at least one summer session of the Linguistic Institute of the Linguistic Society of America. Up to two units of credit granted by the host university under this program may be transferred. Students of descriptive linguistics also are urged to establish a vested interest and a firm basic foundation in some particular language family as early as possible in their graduate career. Linguistically oriented courses in related departments may be counted toward the major if approved by the adviser. The head of the department acts as general adviser to each student until the selection of the field of concentration, at which time the student comes under the guidance of an adviser in his special area.

MATHEMATICS

(Including Statistics)

Head of the Department: PAUL T. BATEMAN
Graduate Supervisor: JAMES W. ARMSTRONG
Correspondence and Information: Graduate Supervisor, Graduate Advising Office, Department of Mathematics, University of Illinois at Urbana-Champaign, 259 Altgeld Hall, Urbana, Illinois 61801

FACULTY

Professors: F. R. ALBRECHT, R. B. ASH, S. B. BANK, R. G. BARTLE, P. T. BATEMAN, D. I. BERG, E. R. BERKSON, B. C. BERNDT, R. L. BISHOP, W. W. BOONE, P. G. BRAUNFELD, D. L. BURKHOLDER, R. W. CARROLL, K. CHEN, E. C. DADE, M. M. DAY, H. G. DIAMOND, J. L. DOOB, R. M. FOSSUM, C. W. GEAR, S. I. GOLDBERG, J. W. GRAY, P. A. GRIFFITH, W. R. G. HAKEN, M. E. HAMSTROM, L. L. HELMS, F. E. HOHN, G. J. JANUSZ, R. P. JERRARD, C. G. JOCKUSCH, F. W. KAMBER, R. P. KAUFMAN, F. B. KNIGHT, R. G. LANGEBARTEL, P. A. LOEB, D. E. MULLER, J. NIEVERGELT, H. O.

Osborn, E. T. Parker, A. L. Peressini, W. V. Philipp, R. R. Rao, I. Reiner, D. J. S. Robinson, H. P. Rosenthal, N. J. Rothman, J. J. Rotman, L. A. Rubel, P. E. Schupp, E. J. Scott, M. Suzuki, G. Takeuti, T. Ting, P. M. Tondeur, H. E. Vaughan, J. H. Walter, P. M. Weichsel, R. A. Wijsman, J. Wolfowitz

Associate Professors: J. R. Alexander, Jr., K. I. Appel, J. W. Armstrong, A. Babakhanian, H. E. Benzinger, Jr., R. E. Bohrer, J. W. Brown, J. D. Buckmaster, R. F. Craggs, L. L. Dornhoff, E. G. Graham, Jr., W. A. Ferguson, R. L. Finney, G. K. Francis, S. S. Jogdeo, H. P. Lotz, L. R. McCulloh, J. B. Miles, H. Paley, N. T. Peck, H. Porta, S. L. Portnoy, J. E. Schubert, D. R. Sherbert, K. B. Stolarsky, W. F. Stout, J. J. Uhl, Jr., K. K. Uhlenbeck, S. V. Ullom, E. C. Weinberg, J. E. Wetzel, K. G. Witz, W. M. Zaring

Assistant Professors: W. Abikoff, S. B. Alexander, F. D. Bateman, G. A. Converse, C. D. Dade, A. Fauntleroy, E. Gray, C. W. Henson, L. McLinden, C. Moreno, E. Peck, C. Phillips, I. M. Reiner, W. S. Wagstaff, Jr.

Graduate Programs. The department offers graduate study leading to the Master of Arts (or of Science) and the Doctor of Philosophy in Mathematics, the Master of Science in the Teaching of Mathematics, and the Master of Arts (or of Science) and the Doctor of Philosophy in Statistics. An advanced certificate in community college mathematics teaching is also available. For detailed information regarding any of these programs, write directly to the graduate supervisor.

Admission. Students may be admitted with full standing if they hold a strong undergraduate degree in mathematics. Students whose undergraduate training in mathematics is deficient will not be admitted to full standing, but may be admitted with deficiencies to be removed during the first year of graduate study.

Statistics. This program of study is for those who wish to concentrate on research in the theory of statistics and to obtain training in the theory and practice of statistical inference from quantitative data. It also provides an appropriate minor for those who wish to develop competence in an area of application of statistics, such as agronomy, biology, chemistry, economics, education, geology, physics, or psychology.

Master's Degree Programs. The master's programs are designed to be completed in one year of full-time study by students entering without deficiencies. However, most students find it necessary to devote at least one additional summer or semester to such study. Students entering with deficiencies may require up to two years to complete the degree. There are no thesis or language requirements and no comprehensive examination is required.

The master's in mathematics may be earned through study in one of three different programs. The General Program requires a total of eight units of study, three of which must be in mathematics at the 400 level. No more than two units of approved electives are permitted. Mathematics 347 and 348 as well as one other approved sequence in mathematics must be completed either at the undergraduate or graduate level. The Specialized Program in Applications of Mathematics to the Physical Sciences and the Specialized Program in the Mathematics in Computation or Optimization have similar requirements.

The master's in the teaching of mathematics requires a total of eight units of study, of which four must be in mathematics and two must be in education. Mathematics 318 and 347 (or 344) are required.

The master's degree in statistics requires a total of eight units of study, including at least three 400-level courses of which two must be approved courses in statistics. Mathematics 365 is required.

Advanced certificate in community college mathematics teaching is designed to be completed in two semesters following completion of a master's degree in mathematics. The program involves student teaching and specialized course work.

Doctoral Degree Programs. Students working toward one of the doctoral degrees usually require from four to six years to complete the requirements. These students must pass the qualifying examination (testing the content of undergraduate courses

in abstract and linear algebra and real and complex analysis), the preliminary examination (testing the content of four areas of graduate mathematics selected by the student and approved by the department), and write a thesis in an area of mathematical research. A reading knowledge of two of the following languages is required: German, French, or Russian.

MECHANICAL AND INDUSTRIAL ENGINEERING

Head of the Department: B. T. Chao
Associate Head of the Department: J. W. Bayne
Co-Chairmen of the Graduate Policy Committee: A. L. Addy and R. E. DeVor
Correspondence and Information: Graduate Programs Office, Department of Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign, 142 Mechanical Engineering Building, Urbana, Illinois 61801

FACULTY

Professors: A. L. Addy, J. W. Bayne, E. L. Broghamer, B. T. Chao, J. C. Chato, M. M. Chen, W. L. Chow, H. E. Cook, A. G. Friederich, B. A. Hertig, W. L. Hull, B. G. Jones, H. H. Korst, J. L. Leach, R. E. Miller, F. A. Morrison, L. C. Pigage, S. L. Soo, W. F. Stoecker, J. J. Stukel, K. J. Trigger, R. A. White
Associate Professors: A. M. Clausing, T. F. Conry, C. Cusano, M. I. Dessouky, R. E. DeVor, J. E. Greene, R. E. Klein, C. S. Larson, R. Mehrabian, D. H. Offner, C. O. Pedersen, L. D. Savage, S. C. Sorenson, H. Streeter, R. P. Strout, J. L. Whisenand
Assistant Professors: R. O. Buckius, G. L. Hogg, Judith S. Liebman, N. R. Miller, W. B. Rouse, M. M. Tseng
Visiting Assistant Professor: T. C. H. Woo

Graduate Programs. The Department of Mechanical and Industrial Engineering offers work leading to the Master of Science in Mechanical Engineering, the Master of Science in Industrial Engineering, and the Doctor of Philosophy in Mechanical Engineering. In Mechanical Engineering, a student may specialize in any of the core areas including thermodynamics, heat transfer, fluid dynamics, multiphase systems, combustion, internal combustion engines, thermal systems including environmental control in buildings, environmental engineering and air pollution controls, kinematics and dynamics of machinery, friction, lubrication and wear, control systems, man-machine systems, and bioengineering. Through these areas, the department has a strong commitment to energy-related research programs. In Industrial Engineering, a student may specialize in any of the several areas in manufacturing systems and operations research including production control and quality control, facilities planning and design, human factors, mathematical programming, simulation, project management, and production process design.

Admission. Based upon the previous preparation of the student, one or more prerequisite courses may be specified by the adviser, but the credit may not apply to the degree. For example, those without experience in digital computers may be required to demonstrate proficiency in this area.

Master of Science. A thesis is required, but can be waived for students terminating their studies with the M.S. degree. A total of eight units (including thesis credits) is required. A full-time student can complete this program in an academic year. Those not writing a thesis are required to offer a minimum of nine units of credit. In such cases, the study program includes one or more units of laboratory investigations, since each student is required to show evidence of ability to do independent study.

Doctor of Philosophy. A master's thesis or equivalent is required of all applicants for Ph.D. study. Those students who enter with a master's degree and who have not

written a thesis or equivalent, will be required to register in laboratory investigations during their first semester of residence on the campus for the purpose of demonstrating their ability to do independent research. Qualifying examinations are to be taken during the semester in which the ninth unit of graduate credit is earned at earliest but no later than the first semester thereafter. A total of sixteen (16) units of course work beyond the B.S. degree is a minimum course requirement for the Ph.D. degree. In order to be accepted as a final doctoral candidate, the student must prepare a thesis proposal and take an oral preliminary examination. If successful, the candidate completes the thesis work and takes a final oral examination.

METALLURGY AND MINING ENGINEERING

Head of the Department: C. A. WERT
Correspondence and Information: Head of the Department, Department of Metallurgy and Mining Engineering, University of Illinois at Urbana-Champaign, 201 Metallurgy and Mining Building, Urbana, Illinois 61801

FACULTY

Professors: C. J. ALTSTETTER, P. A. BECK, H. K. BIRNBAUM, R. W. BOHL, H. E. COOK, A. J. DEWITTE, G. EHRLICH, D. S. LIEBERMAN, M. METZGER, E. N. PUGH, T. J. ROWLAND, J. A. SIMON, C. M. WAYMAN, C. A. WERT
Associate Professors: D. BOND, J. E. GREENE, F. V. LAWRENCE, JR., R. MEHRABIAN

Graduate Programs. The Department of Metallurgy and Mining Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy in Metallurgical Engineering and the Master of Science and Doctor of Philosophy in Mining Engineering. The faculty members have a widely varied background of engineering and science, and graduates go into a broad range of industrial, government, and university positions. Close association exists with staff members in other departments having programs in the properties of solids.

Admission. Graduate students in metallurgical or mining engineering may have undergraduate degrees in a number of disciplines. Graduates with degrees in metallurgy or mining engineering fit into the graduate programs easily, as well as the many graduate students who come from other engineering or science disciplines. Graduates of departments of mechanical engineering, physics, chemistry, and ceramics are represented among our student body.

Master of Science. A candidate for the Master of Science is required to have a minimum of eight units of graduate work, including a thesis. If a petition to waive the thesis is granted, a minimum of nine units of graduate work is required. A thesis is required of candidates who hold research assistantships.

Doctor of Philosophy. Students desiring to work for the Doctor of Philosophy are required to pass the departmental qualifying examination. This oral examination must be taken no later than the end of the first semester after receiving the Master of Science from this department, or after completing an equivalent amount of graduate work.

The minor requirement of the department for the Doctor of Philosophy may be satisfied by taking courses in fields such as ceramics, chemistry, geology, mathematics, theoretical and applied mechanics, nuclear engineering, and physics. Although reading knowledge of a foreign language is helpful, there is no formal requirement.

MUSIC

(Including Music Education and Musicology)

Director of the School of Music: ROBERT E. BAYS
Correspondence and Information: Office of Graduate Studies, School of Music, University of Illinois at Urbana-Champaign, Urbana, Illinois 61801

FACULTY

Professors: J. L. BAILEY, R. E. BAYS, H. BEGIAN, E. S. BERRY, A. M. CARTER, W. R. COGGINS, R. J. COLWELL, H. A. DECKER, C. DELANEY, M. DOBBS, K. DRAKE, G. M. DUKER, B. E. EDLEFSEN, L. T. FREDRICKSON, J. C. GARVEY, R. E. GRAY, D. GUNSALUS, J. HAMILTON, T. L. HOLDEN, G. H. HUNTER, B. B. JOHNSTON, J. R. KELLY, E. D. KISINGER, E. J. KROLICK, C. LEONHARD, D. LLOYD, J. LYKE, E. LONDON, A. J. MCDOWELL, G. MAGYAR, S. MARTIRANO, B. NETTL, G. PERICH, C. L. RICHARDS, A. L. RINGER, P. ROLLAND, D. W. SANDERS, H. C. SCHMITT, R. B. SMITH, S. STRAVINSKY, R. H. SWENSON, N. M. TEMPERLEY, R. E. THOMAS, W. WARFIELD, G. E. WILSON, J. C. WUSTMAN
Associate Professors: J. W. BEAUCHAMP, H. BRÜN, F. CRAWFORD, E. L. DALHEIM, M. ELYN, W. H. HEILES, M. HOFFMAN, A. L. JOHNSON, H. KELLMAN, D. KIMPTON, D. M. KOHUT, D. L. MILLER, E. NOTH, W. W. OLSON, D. T. PERANTONI, M. POWELL, R. J. RAY, JR., J. SHAPIRO, T. V. SIWE, P. VERMEL, T. J. WISNIEWSKI, P. ZONN
Assistant Professors: R. ASLANIAN, A. BAGNALL, A. BLATTER, R. S. BLUM, F. FAIRCHILD, V. FARMER, J. FORSYTHE, B. GUNTHER, D. HICKMAN, E. HOOVER, J. MELBY, JR., G. D. PETERS, J. G. SMITH, T. WARD

Graduate Programs. The School of Music offers graduate study leading to the Master of Music, Doctor of Musical Arts, Doctor of Philosophy in Musicology, Master of Science in Music Education, Doctor of Education in Music Education, and the Advanced Certificate in Music Education. Complete details of these programs may be found in the school's brochure on graduate study in music.

RESEARCH AND PROFESSIONAL CURRICULA

Master of Music. The fields of specialization for the M. Mus. degree are musicology; music theory; composition; performance and literature (piano, organ, voice, orchestral instruments); choral music; and vocal accompanying and coaching.

Admission. Requirements for admission are a Bachelor of Music degree from the University of Illinois, or an equivalent degree from another accredited institution (students holding other degrees may be admitted, but will be expected to make up any deficiencies). Those majoring in musicology are generally expected to have a minimum average of 4.25.

Applicants in performance and literature must pass a qualifying audition before their major division or submit satisfactory recordings.

Applicants in musicology, theory, or composition must present writings or other evidence of their ability to pursue work at the graduate level.

Language Requirements. Applicants in voice are required to have had one year each at the college level, or two years at the high school level, of French, German, and Italian. Applicants in other applied music areas and in theory-composition are required to have had one year of any language at the college level. Applicants in musicology must give evidence of a reading knowledge of French or German. Students otherwise admissible may satisfy any language deficiencies concurrently with graduate studies.

Entrance Examinations. All prospective candidates for the M. Mus. degree must pass entrance examinations in music history and theory. These examinations must be taken immediately prior to the student's first registration.

Degree Requirements. Candidates for the M. Mus. in theory-composition and in performance and literature must earn at least eight units, including two units at the 400 level in their major field, and one unit in problems and methods. Candidates in performance and literature must earn two units in the music literature course in their major applied area. Candidates in musicology must earn two units in introduction to musicology, two units in the seminar in musicology and .5 unit in notation. Electives in music theory, history, and literature, and other music and non-music courses will be chosen in consultation with the candidate's graduate advisor. A graduate recital is required of all candidates in performance and literature. However, the recital required of voice majors may, by collective action of the voice division, be waived. Candidates in musicology and theory must write a thesis, for which two units of credit are given. Candidates in composition must present a portfolio of their works for approval by the composition faculty.

Doctor of Musical Arts. The fields of specialization for the D.M.A. degree are composition, piano, organ, choral music, voice, violin, viola, cello, wind instruments, and percussion instruments.

Admission. Prerequisites for admission are: (1) The M. Mus. degree from the University of Illinois, or an equivalent degree from another accredited institution, with a major in one of the areas of specialization listed above. (2) A high level of proficiency in composition or performance. Candidates in composition must submit original scores for review. Candidates in performance and literature must pass a qualifying audition or submit satisfactory recordings. (3) Appropriate experience in ensemble playing and/or score reading. (4) The successful completion of approximately thrity-two semester hours (or the demonstration of an equivalent background) in the liberal arts and sciences, including a minimum of six hours in history, and six hours in literature and philosophy. Candidates in voice must have fulfilled all foreign language requirements considered as prerequisites for the M. Mus. (5) The successful completion of entrance examinations in music history and theory for the M. Mus.

Degree Requirements. Candidates must earn a minimum of sixteen units beyond the requirements for the master's degree. The program is worked out in consultation with the student's graduate adviser in terms of special needs, interests, and abilities; it will ordinarily include a minimum of three units in the major field of specialization, two units in advanced music literature courses, and two units in a minor field. A prelinimary examination is taken once all course work is completed.

Language Requirements. All candidates will be required to demonstrate proficiency in at least one language other than English. Each division may specify which language is required or may require proficiency in more than one language. Language requirements can be satisfied by evidence of two years of undergraduate study, by successful completion of a two-semester 400-level reading course, or by satisfactory test scores.

Doctoral Project and Thesis. In the fields of composition, and performance and literature six units are devoted to a special doctoral project. Composers must produce a large-scale original score. Performers must demonstrate comprehensive repertory study in the form of two solo recitals, or one solo recital and two of the following options: a concerto; a major operatic or oratorio role; a chamber music program; a lecture-recital; or the preparation of and, when appropriate, conducting of a concert by an instrumental or vocal ensemble. In addition, both fields have a research requirement that serves in lieu of a thesis. In the field of choral music, one unit is given for the preparation and presentation of a one-hour program representative of a comprehensive repertory and four units are devoted to the writing of a thesis.

Doctor of Philosophy in Musicology. The Ph.D. in musicology is intended for those whose interests lie in research in the history of music, systematic musicology, and ethnomusicology.

Admission. Prerequisites for admission are: (1) The M. Mus. in musicology from the University of Illinois, or an equivalent degree from another accredited institution.

(2) A minimum of thirty-two semester hours in the liberal arts and sciences, normally including general history, philosophy, and literature. (3) The successful completion of entrance examinations in music history and theory for the M. Mus.

Degree Requirements. A minimum of sixteen units must be earned beyond the requirements for the master's degree, including at least two units in the seminar in musicology and .5 unit in notation. Although no formal outside minor is required, students are expected to take courses in fields outside music that are appropriate to the proposed area of dissertation research. A preliminary examination is taken once all course work is completed.

Language Requirements. Proficiency is required in German and at least one other language, depending on the proposed field of specialization. This requirement can be satisfied by evidence of two years of undergraduate study, by completion of a two-semester 400-level reading course with a grade of at least B, or by satisfactory test scores.

Thesis. Eight of the total of sixteen units are normally devoted to the writing of an original doctoral thesis.

MUSIC EDUCATION CURRICULA

Master of Science in Music Education. An applicant for admission must hold a bachelor's degree in music education with an admission average of at least 4.0. Candidates for this degree must earn a minimum of four units in music courses, two units in education courses, and two units of electives. One of the four units in music courses must be in music education. All students pursuing this degree must complete placement examinations in music history and theory and in the major performing medium during the registration period of their first session in residence. A thesis is not required. A full-time student can complete this program in one academic year or four summer sessions. The residence requirement may be fulfilled by one semester and one summer or by three summers of full-time study.

An alternate program for Bachelor of Music graduates requires four units in music courses, one unit in educational psychology, one unit in history and philosophy of education, two units of electives, and nine hours of undergraduate professional education including six hours in student teaching. Enrollment in a summer session contiguous to the year of residence is required.

Advanced Certificate in Music Education. This program, designed to provide advanced professional preparation for music educators, requires a minimum of one year of graduate study beyond the master's degree.

Admission. A candidate for admission must hold a master's degree in music or music education and must have completed satisfactorily two years of professional employment in music education. At first registration, placement examinations are administered in music history, music theory, and applied music.

Program. A minimum of eight units beyond the master's degree are required, including one unit in music education courses and one unit in educational psychology. Students not holding a valid teaching certificate in music must fulfill certification requirements of the state in which they are employed.

Doctor of Education in Music Education. This program offered jointly by the School of Music and the College of Education, is designed to develop leaders in music education with a high level of musical, intellectual, and professional competence.

Admission. An applicant for admission must hold a master's degree with a major in music or music education. Admission is determined by examinations in music history, music theory, music education, and applied music; personal interviews; record of previous education and experience; and recommendations from persons who have known the applicant. A report of the applicant's score on the Miller Analogies Test should accompany his application for admission.

Program. At least sixteen units of work beyond the master's degree are required, including six units in music courses and six units in education courses. No more than two units of credit in applied music may be counted toward the degree. A thesis is required. It may be in the area of improving professional practice and may be a field study. The residence requirement may be fulfilled by full-time study in two consecutive semesters or in one semester, a contiguous summer session, and one additional summer session.

NUCLEAR ENGINEERING

Chairman of the Program: George H. Miley
Associate Chairman: Arthur B. Chilton
Correspondence and Information: Nuclear Engineering Office, University of Illinios at Urbana-Champaign, 214 Nuclear Engineering Laboratory, Urbana, Illinois 61801

FACULTY

Professors: F. T. Adler, R. A. Axford, R. W. Bohl, A. P. Boresi, B. T. Chao, B. E. Cherrington, A. B. Chilton, G. A. Costello, J. J. Dorning, H. S. Ducoff, B. B. Ewing, O. L. Gaddy, L. Goldstein, D. F. Hand, T. J. Hanratty, C. D. Hendricks, J. P. Hummel, B. G. Jones, J. S. Koehler, R. J. Martin, M. S. McVay, G. H. Miley, J. E. Pearson, J. T. Verdeyen, M. E. Wyman
Associate Professors: H. Merkelo, D. R. O'Boyle, R. J. Turnbull, B. W. Wehring
Assistant Professors: R. P. Ray, F. H. Southworth

Graduate Programs. Nuclear engineering offers work leading to the Master of Science and Doctor of Philosophy and provides courses and research facilities for doctoral candidates in nuclear engineering and related fields.

Admission. The program in nuclear engineering is open to all graduates in engineering, mathematics, and the physical sciences. It is recommended that they also submit letters of reference and information as to their rank in class. Undergraduate courses in differential equations, advanced calculus, and atomic physics are required as background for the nuclear engineering program. A student may be admitted before completion of these three prerequisites, but must then allow an additional semester or summer of study for the completion of the master's degree.

Degree Requirements. The general requirements of the Graduate College must be met for either degree. A candidate for the M.S. degree who does not submit a thesis must complete nine units of graduate work.

Facilities. The Illinois Advanced TRIGA reactor is located on campus for research and teaching in nuclear engineering and operates at a steady state of power of 1.5 megawatts. The reactor can be pulsed to lower levels of 6,000 megawatts for special studies. Teaching facilities include a nuclear metallurgy laboratory; a radiochemistry and nuclear instrumentation laboratory; a heat transfer, fluid flow, and turbulence laboratory; several subcritical natural uranium assemblies; two neutron generators; and a direct energy conversion laboratory.

NUTRITIONAL SCIENCES

Chairman of the Committee on Nutritional Sciences: P. V. Johnston
Correspondence and Information: Nutritional Sciences Program, University of Illinois at Urbana-Champaign, 204 Burnsides Research Laboratory, Urbana, Illinois 61801

FACULTY

Professors: D. H. Baker, C. L. Davis, R. M. Forbes, K. E. Harshbarger, B. E. Haskell, F. A. Kummerow, B. L. Larson, S. P. Mistry, T. Nishida, E. G. Perkins, W. J. Visek
Associate Professors: D. E. Bauman, J. H. Clark, P. V. Johnston
Assistant Professors: R. R. Bell, J. W. Erdman, Jr., J. A. Milner, M. F. Picciano, J. L. Robinson

Graduate Programs. An interdepartmental graduate training program leading to the Master of Science and Doctor of Philosophy in Nutritional Sciences is offered under the auspices of a University Committee on Nutritional Sciences. The degree requirements are designed to provide sufficient flexibility to enable students to pursue study in one of several areas of specialization within the broad field of the nutritional sciences. These specialties include experimental nutrition as it applies to microbes, animals, and man; nutritional biochemistry; and the chemistry of nutritional compounds. The program does not provide training in dietetics and community health.

Admission. Applicants are expected to have sound basic courses in nutrition, chemistry, biology, and mathematics. Deficiencies in these subjects must be removed during the first year of graduate study.

Master of Science. Requirements for the M.S. include courses in general biochemistry, two courses in advanced nutrition and one semester of seminar. Additional courses are available in such diverse subjects as laboratory techniques in animal biochemistry, instrumental analysis, foods and nutrition, lipid metabolism, nutritional biochemistry, human and animal nutrition, food science, anthropology, sociology, and agricultural economics. The M.S. may be taken with or without a thesis. The minimum course work requirements for the M.S. are eight (non-thesis) and six (with thesis).

Doctor of Philosophy. In addition to maintaining a satisfactory average (4.0/5.0) in formal course work, Ph.D. students are required to take a qualifying examination, an oral preliminary examination, and a final thesis examination. There is no foreign language requirement, but students whose native language is not English are required to have competence in English.

PHILOSOPHY

Chairman of the Department: J. D. Wallace
Correspondence and Information: Director of Graduate Studies, Philosophy Department, University of Illinois at Urbana-Champaign, 105 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professors: C. E. Caton, B. J. Diggs, D. W. Shwayder, H. M. Tiebout, J. D. Wallace, F. L. Will
Associate Professors: H. S. Chandler, A. Melnick, F. W. Neely, R. L. Schacht
Assistant Professors: L. D. Gordon, R. Monk, M. S. Shapira, R. G. Wengert

Graduate Programs. The normal program of graduate study for philosophy majors is directed toward the Doctor of Philosophy, but a limited number of students who wish to work for the Master of Arts is admitted. Graduate students majoring in other fields who wish to offer philosophy as a minor, or to include philosophy in their programs in a less formal way, are encouraged to consult with members of the graduate faculty in philosophy in order to plan appropriate courses of study.

Admission. Each student should have had a course in elementary logic, a course in the theory of knowledge, a course in ethics, and a general course in the history of philosophy (the main figures of ancient and modern philosophy). Students deficient in one or more of these areas may be admitted with deficiencies to be removed by taking courses recommended by the departmental director of graduate studies after consultation with the student.

All applications for admission only, as well as applications for admission and financial aid, must be supported by three letters of recommendation. The letters should be in each case from persons qualified to speak of the candidate's aptitude for graduate study in philosophy. Candidates are asked to have these letters transmitted directly to the committee on Admissions and Financial Aid of the Department of Philosophy.

All applicants for admission are required to take the General Aptitude portion of the Graduate Record Examination and to have their scores transmitted to the department.

Master of Arts. Each student who has passed his preliminary examination for the Ph.D. is automatically qualified by the department to receive the A.M. This degree may also be earned by completing one full year of residence study in philosophy at the University of Illinois, including six of the eight units required for the degree, submitting a substantial essay, and passing an oral examination on the essay given by a committee appointed by the chairman of the department. A degree earned in this way is normally a terminal one. A minimum grade-point average of 4.0 is required for this degree.

Doctor of Philosophy. In the preliminary examination, required of all candidates, each student is required to demonstrate a basic competence in the following four broad areas of philosophy: history of philosophy, theory of knowledge, metaphysics, and ethics and value theory.

Candidates are not generally required to offer work in a minor field outside the department. However, in those cases where advanced study in philosophy would be strengthened by the inclusion of work in a related field, the student may be advised to include such work in the courses taken to satisfy the requirements for the degree. The amount of such work is limited to two units, unless the student wishes the work to count as an extradepartmental minor. Then the minimum work accepted is two units, the maximum four. A minimum grade-point average of 4.0 is required for this degree.

Prior to taking the preliminary examination each candidate is required to demonstrate a basic competence in mathematical logic. This may be done by passing an approved course in the subject or passing a proficiency examination administered by the department.

Each student must demonstrate a basic reading knowledge of French and German before the Department of Philosophy will certify that the student has passed the preliminary examination. Deviations from this policy require the approval of the chairman of the department.

Subsequent to the preliminary examination, the student must submit an acceptable dissertation in one of the above four areas of philosophical research and pass a final examination on the dissertation. The acceptability of the dissertation is judged, and the final examination administered, by the student's doctoral committee.

Concentration in the Area of History and Philosophy of Science. The Departments of History and Philosophy jointly offer, for work toward the A.M. and Ph.D. degrees, a special area of concentration in History and Philosophy of Science. Students interested in this program will enroll in, and receive their degrees from, either the history or the philosophy department, depending on the focus of their interests. Undergraduate background requirements for admission to the program are flexible; although an undergraduate concentration in either history or philosophy is normally desirable, so also is a strong background in science, and students with such back-

ground, but only weak training in history or philosophy, will be considered for admission. The course requirements for admission to the Department of Philosophy and the means of remedying deficiencies in undergraduate training, as stated in the second paragraph of the section entitled Admission and Aid above, are not applicable to students applying to this program. The admission is the same as that stated for each of the two departments, as is the information to be submitted with each application for admission. Further information is available from the Department of Philosophy.

PHYSICAL EDUCATION

Head of the Department: ROLLIN G. WRIGHT
Correspondence and Information: Benjamin H. Massey, Director, Graduate Program Office, Department of Physical Education, University of Illinois at Urbana-Champaign, 129 Freer Gymnasium, Urbana, Illinois 61801

FACULTY

Professors: A. T. CHESKA, G. LUESCHEN, B. H. MASSEY, D. O. MATTHEWS, A. C. MOORE, R. H. POHNDORF, M. THOMPSON, R. G. WRIGHT
Associate Professors: R. A. BOILEAU, J. DAVENPORT, C. J. DILLMAN, M. HARRIS, P. HILL, A. HOYMAN, W. JOHNSON, R. KELLER, T. KRIZAN, T. LOHMAN, M. SOUDER, M. TREKELL, O. YOUNG
Assistant Professors: D. E. ARNOLD, W. CONSIDINE, H. DEUTSCH, K. FRY, D. GORDON, F. GREBNER, S. GREENDORFER, K. KAHRS, J. LEWKO, M. LOOVIS, J. MANCUSO, J. MISNER, K. NEWELL, J. PIRNAT, G. ROBERTS, M. SLAUGHTER, J. SMITH, J. TEEPLE, B. WILLIAMS

Graduate Programs. The Department of Physical Education offers graduate programs leading to the Master of Science in Physical Education; the Master of Science in the Teaching of Physical Education, emphasizing teaching competency; and the Doctor of Philosophy in Physical Education.

Admission. Admission for the Master of Science and the Master of Science in the Teaching of Physical Education require: a minimum grade point average of 4.0 for the last sixty hours of undergraduate work; scores on the Miller Analogies Test and/or the aptitude portion of the Graduate Record Examination; and three letters of recommendation. The admission requirements for the Doctor of Philosophy program is basically the same with the following additions; scores on *both* of the above tests; graduation from an accredited master's program; and a minimum average of 4.5 for graduate work completed.

Master of Science. A candidate for the Master of Science must complete eight units, four in physical education and two in another discipline. Two units of credit are earned while writing the thesis. It is possible for a full-time student to complete this degree program on one academic year plus one summer session.

Master of Science in the Teaching of Physical Education. This program is primarily for persons with teacher certification who wish to engage in advanced study relative to their area of teaching. Candidates for this degree must complete eight units; four of which must be in physical education and two in education. It is possible for a full-time student to complete this degree program in one academic year plus one summer session.

Doctor of Philosophy. The minimal requirements for the degree of Doctor of Philosophy are: eight units of course work beyond the master's degree (four in physical education and four in another discipline); the ability to traslate two foreign languages, or to read, write, and converse satisfactorily in one (two additional approved graduate

courses may be substituted for each of the two required foreign languages); successful completion of the preliminary examination; eight units of thesis research; and successful completion of the final examination.

PHYSICAL SCIENCES

Correspondence and Information: Professor D. H. Secrest, University of Illinois at Urbana-Champaign, 155 Noyes Laboratory, Urbana, Illinois 61801

Graduate Programs. Two degree programs in physical science, one leading to the Master of Science in the Physical Sciences and the other leading to the Master of Science in the Teaching of Physical Sciences are offered for active or intended secondary school teachers.

A special program leading to the Master of Science in the Physical Sciences is available to meet the needs of teachers who wish to get a broad view of the physical sciences rather than to specialize in one department. Since the program is designed primarily for those preparing to teach the physical sciences, chemistry and physics are emphasized. Students working toward degrees under the provisions of this program are expected to seek approximately equal proficiency in both physics and chemistry; those whose undergraduate work has emphasized chemistry should balance this by weighting the graduate work in favor of physics, and vice versa.

All courses in astronomy, chemistry, computer science, geology, mathematics, and physics which normally may be applied for graduate credit are acceptable toward the degree. To qualify for the degree, a student must present at least one course in mathematics beyond calculus, for which calculus is a prerequisite. In addition, the requirements for teacher certification must have been met.

Candidates for the Master of Science in the Teaching of the Physical Sciences, which is distinct from the program described above, must earn four units in the physical sciences, two units in education (see page 35), and two units in electives. The courses in the physical sciences and the electives must be selected with the approval of the adviser. The electives may be in the physical sciences, in education, or in exceptional cases, in other fields. The student must also have met the requirements for teacher certification.

A thesis is optional in both of these programs; however, no more than two units of thesis credit may be applied toward degree requirements. There is no language requirement.

PHYSICS

Head of the Department: R. O. Simmons
Correspondence and Information: Graduate Advising Office, Department of Physics, University of Illinois at Urbana-Champaign, Physics Building, Urbana, Illinois 61801

FACULTY

Professors: F. T. Adler, D. Alpert, A. C. Anderson, W. D. Arnett, G. Ascoli, P. Axel, G. A. Baym, S. A. Bowhill, F. C. Brown, R. M. Brown, M. K. Brussel, S. J. Chang, P. G. DeBrunner, J. D. Dow, H. G. Drickamer, G. Ehrlich, C. P. Flynn, H. Frauenfelder, D. M. Ginsberg, A. V. Granato, P. Handler, A. O. Hanson, L. E. Holloway, N. Holonyak, J. P. Hummel, I. Iben, M. V. Klein, J. S. Koehler, L. J. Koester, U. E. Kruse, L. S. Lavatelli, D. Lazarus, D. E. Mapother, R. J. Maurer, W. L. McMillan, Y. Ogura, T. A. O'Halloran, C. J. Pethick, D. Pines, M. J. Raether, D. G. Ravenhall, C. S. Robinson, G. A. Russell, C. T. Sah, M. B.

SALAMON, R. D. SARD, C. B. SATTERTHWAITE, R. O. SIMMONS, C. P. SLICHTER, J. H. SMITH, J. N. SNYDER, H. J. STAPLETON, J. D. SULLIVAN, J. W. TRURAN, A. WATTENBERG, W. S. WILLIAMS, M. WORTIS, J. A. WRIGHT, H. W. WYLD

Associate Professors: J. H. CAHN, B. I. EISENSTEIN, E. A. JACKSON, L. M. JONES, T. B. W. KIRK, A. B. KUNZ, F. K. LAMB, J. M. MOCHEL, V. R. PANDHARIPANDE, F. M. PROPST, R. L. SCHULT, B. A. SHERWOOD, J. D. STACK, D. C. SUTTON, W. D. WATSON

Assistant Professors: M. ALTEARELLI, H. BOHMER, L. S. CARDMAN, G. E. GLADDING, D. Q. LAMB, M. R. NELSON

Graduate Programs. The Department of Physics offers graduate work leading to the Master of Science, the Doctor of Philosophy, and the Master of Science in the Teaching of Physics.

There is opportunity for experimental or theoretical specialization in nuclear physics; elementary particle physics; nuclear magnetic and electron spin resonance; astrophysics; the physics of solids, including research on ionic crystals, metals, semiconductors, superconductors, biomolecular, and surface physics; the properties of liquid helium; and plasma physics. Graduate study in atmospheric physics, aeronomy and in several areas of applied physics is available in conjuction with other departments in the University.

Admission. Requirements for admission to the graduate programs in physics are twenty hours of physics excluding courses in general physics and including a semester of intermediate theoretical mechanics; two semesters of intermediate electricity and magnetism or the equivalent. Advanced undergraduate courses in light, thermodynamics, and atomic and quantum physics, and undergraduate study of a foreign language are strongly recommended. Students whose undergraduate training in physics is deficient in one or more basic areas are often admitted on limited standing with deficiencies to be removed during the first year of graduate study.

Master of Science and Master of Science in the Teaching of Physics. These programs require eight units of graduate courses, and are usually completed in one year of full-time study by students entering on full standing. Students entering with deficiencies may require up to two years to complete the degree requirements. Precise statements of degree requirements may be obtained from the Graduate Advising Office of the Department of Physics.

Doctor of Philosophy. Students working for the Ph.D. usually require from four to six years to complete the requirements. Students admitted with full standing are expected to pass the qualifying examinations within the first eighteen months of residence and the preliminary examinations within the following two years.

Departmental requirements for the Doctor of Philosophy in addition to the general requirements of the Graduate College, are described in a pamphlet which may be obtained from the Graduate Advising Office of the Department of Physics.

Related Programs. For information concerning applied physics (mathematics) see page 109; for information concerning astronomy, see page 57; for information concerning atmospheric science, see page 57; for information concerning biophysics, see page 106. A doctoral program in chemical physics is described on page 61.

PLANT PATHOLOGY

Head of the Department: RICHARD E. FORD

Correspondence and Information: Head of the Department of Plant Pathology, University of Illinois at Urbana-Champaign, 218 Mumford Hall, Urbana, Illinois 61801

FACULTY

Professors: R. E. Ford, J. W. Gerdemann, D. Gottlieb, E. B. Himelick, A. L. Hooker, R. D. Neely, P. D. Shaw, M. C. Shurtleff, J. B. Sinclair
Associate Professors: D. I. Edwards, L. E. Gray, R. B. Malek, J. D. Paxton, D. F. Schoeneweiss
Assistant Professors: R. M. Goodman, W. Hartstirn, B. J. Jacobsen, H. Jedlinski, S. M. Lim, G. M. Milbrath, S. M. Ries, D. G. White

Graduate Programs. The Department of Plant Pathology offers a full complement of courses and study leading to the Master of Science and Doctor of Philosophy degrees. All students are required to present themselves for an oral examination in plant pathology before their Program of Study Committee after the first semester of graduate study.

Training consists of a flexible program of courses and research in plant pathology and allied sciences. Areas of specialization are diseases of field, fruit, vegetable, turf, tree, or ornamental crops; virology; nematology; mycology; phytobacteriology; fungicides; antibiotics; physiology of fungi; biochemistry of plant diseases; disease resistance; etiology; epiphytology; soil-borne diseases; and variability in plant pathogens.

Admission. Applicants for graduate study are screened by a departmental admissions committee.

Master of Science. A candidate for the Master of Science must complete eight units of credit including the presentation of an acceptable thesis, and pass an oral examination. Credit in equivalent courses earned at other institutions may be accepted, at the discretion of the department head and the Student's Program of Study Committee. The candidate must maintain an average of 4.0 for the master's program.

Doctor of Philosophy. Students working toward the Ph.D. usually require three to five additional years beyond the master's. Eight units of course work, including required courses, must be completed beyond the master's to qualify for the preliminary examination. An oral preliminary examination before five faculty members, including three from the department and two from outside the department, is required. A final examination by the same committee follows the presentation of an acceptable dissertation. A grade-point average of at least 4.0 is required for the Ph.D. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

POLITICAL SCIENCE

Head of the Department: E. A. Kolodziej
Correspondence and Information: Department of Political Science, University of Illinoi at Urbana-Champaign, 361 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: M. Davis, S. K. Gove, E. A. Kolodziej, R. L. Merritt, P. Monypenny, S. S. Nagel, J. W. Peltason, R. E. Scott, L. Seligman, G. T. Yu
Associate Professors: P. G. Bock, I. H. Carmen, B. Carroll, S. P. Cohen, S. A. Douglas, A. B. Fields, B. Glad, M. Hobbs, R. E. Kanet, M. G. Weinbaum, M. E. Weinstein, R. Weissberg
Assistant Professors: S. Hansen, D. E. McHenry, P. F. Nardulli, M. Preston, R. Rothman, B. Rundquist, S. Seitz
Instructor: H. T. Sanders

Graduate Programs. The Department of Political Science offers work leading to the degrees of Master of Arts and Doctor of Philosophy. Graduate work is conducted in the following special fields: American government and politics, comparative government and politics, international law and relations; political behavior, and political theory.

Admission. The student must have had a minimum of twenty hours of undergraduate work in political science, economics, finance, psychology, sociology, or history, not less than twelve hours of which must have been in political science, which may include three hours in constitutional history.

Master of Arts. Requirements for the master's degree include eight units of credit, and an acceptable thesis or substantial research essay in a departmental course.

The department also administers a program leading to the Master of Arts in Public Administration. This program is matched to the individual needs and objectives of students. Programs for students without public service employment usually incorporate an internship of at least three months.

Doctor of Philosophy. Students planning to continue toward the doctorate must be admitted to candidacy. Such students should apply for admission to candidacy in their third semester of graduate training or after the completion of eight units of graduate work. The A.M. degree is not a prerequisite to working toward the doctorate, but admission to candidacy is.

A doctoral candidate must show familiarity with all the fields of the discipline by successfully completing one course in each of the five areas. Competence must be demonstrated either in foreign languages, or in quantitative methods and analysis, or in a combination of these as appropriate to the candidate's research interests. Requirements also include passing a written and oral preliminary examination after completion of sixteen units. The preliminary examination tests competence in two areas of political science and in one outside minor area. Although teaching is not a general Graduate College requirement, this department requires Ph.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

Further information on all these programs may be obtained by writing directly to the department.

POPULATION STUDIES

Correspondence and Information: Paul Handler, Chairman, Population Studies Committee, University of Illinois at Urbana-Champaign, 57 Coordinated Science Laboratory, Urbana, Illinois 61801

Graduate Programs. The social implications of population growth are of considerable interest to many students. Since the approach to this area of study is multidisciplinary, those students who wish to focus part of their programs of study on this issue will be taking courses offered by several departments, including those available in the social sciences, the life sciences, and mathematics.

PSYCHOLOGY

Head of the Department: JOSEPH E. MCGRATH

Correspondence and Information: Graduate Admissions and Records Office, Department of Psychology, University of Illinois at Urbana-Champaign, 305 Psychology Building, Champaign, Illinois 61820

FACULTY

Professors: J. A. Adams, H. W. Ades, R. C. Anderson, E. M. Banks, S. W. Bijou, J. Campione, R. B. Cattell, G. L. Clore, J. B. Cohen, F. Costin, J. G. Davis, E. Donchin, D. E. Dulany, C. W. Eriksen, T. N. Ewing, M. Fishbein, R. E. Flexman, W. M. Gilbert, L. R. Goulet, H. W. Hake, R. Hamlin, K. Hill, J. Hirsch, C. O. Hopkins, C. L. Hulin, L. G. Humphreys, J. McV. Hunt, F. Kanfer, W. E. Kappauf, S. Komorita, L. H. Lanier, P. R. Laughlin, J. E. McGrath, O. H. Mowrer, C. E. Osgood, R. D. Parke, G. L. Paul, D. R. Peterson, K. E. Renner, S. N. Roscoe, R. L. Sprague, W. M. Steinman, M. M. Tatsuoka, P. Teitelbaum, H. C. Triandis, L. R. Tucker, M. Wagman, M. Weir, N. A. Wiggins-Hirschberg, R. Wyer

Associate Professors: D. Bernstein, W. Brewer, A. Brown, M. Coles, L. B. Cohen, G. B. Graen, G. Z. Greenberg, W. T. Greenough, L. E. Jones, A. K. Jonietz, R. P. Larsen, R. Linn, J. W. Loeb, S. Porges, J. Rappaport, W. Redd, E. Satinoff, E. Seidman, D. T. Shannon, C. Trahiotis, R. Williges

Asssistant Professors: L. C. Ate, G. Baxley, M. Birnbaum, S. Carter-Porges, J. L. Cohen, E. Diener, C. Dweck, A. Folsum, S. L. Golding, H. Halff, R. Henderson, C. Lewis, T. Moore, R. Nay, E. Shoben, R. Terborg, C. Wickens

Graduate Programs. The Department of Psychology offers graduate work leading to the degrees of Master of Arts, Master of Science, Doctor of Philosophy, and Doctor of Psychology.

Doctor of Philosophy programs are offered in the following areas of psychology: biological, developmental, clinical and counseling, experimental, industrial, personality, quantitative, and social. The Master of Arts degree is awarded to students in the above programs as an intermediate degree. Master of Science programs are offered as terminal degrees in personnel psychology and in quantitative psychology, and as an intermediate degree in the clinical psychology program leading to the Doctor of Psychology degree. The Doctor of Psychology degree is restricted to clinical psychology.

Admission. The candidate for admission to a Master of Arts or Doctor of Philosophy program should ordinarily have the following preparation: a minimum of fifteen hours in psychology, a laboratory course in experimental psychology and a course in statistics, a one-year course in another laboratory science, and high scores on the Graduate Record Examination. Preference is given to students who have taken mathematics beyond college algebra and to those who have had some research experience.

The candidate for admission to a Master of Science program in personnel psychology or in measurement must ordinarily have completed an undergraduate major in the applied psychology curriculum at the University of Illinois.

Admission to the Doctor of Psychology program is based on a combination of criteria including adequacy of preparation in the behavioral sciences, excellence of undergraduate academic performance, scores on the Graduate Record Examination, and a history of involvement and successful performance in professionally relevant activities.

It is not possible to accept all applicants who meet the minimal requirements for any of the above programs because admissions to graduate study in psychology are limited in number.

Master of Arts. The Master of Arts degree is awarded as an *intermediate* degree to students who are candidates for the Doctor of Philosophy degree when they have completed satisfactorily eight units of graduate work, including an acceptable thesis.

Master of Science. The Master of Science degree in personnel psychology, in engineering psychology, and in applied measurement, is awarded as a *terminal* degree to candidates who complete satisfactorily eight graduate units as prescribed in the three respective programs, after completing an appropriate applied psychology undergraduate program.

The Master of Science degree in clinical psychology is awarded as an *intermediate* degree only to students who are candidates for the Doctor of Psychology degree, when they have successfully completed satisfactorily at least eight units of graduate study, including four units of practicum (Psych. 446) and supervised work with program faculty (Psych. 490) and an acceptable master's level paper on an appropriate area of applied clinical practice.

Doctor of Philosophy. The Doctor of Philosophy degree is awarded to candidates who complete an approved program in their areas of specialization and meet department and graduate college requirements for the degree. This must include: (a) at least, twenty-four graduate units, (b) satisfactory performance on qualifying examinations in: quantitative methods, conceptual foundations of psychology, and in the areas of specialization; (c) a master's thesis or equivalent; (d) appropriate advanced courses and seminars in the area of specialization and in related and supporting areas; (e) satisfactory performance on an oral preliminary examination; (f) completion of an acceptable Ph.D. dissertation and satisfactory performance on an oral examination in defense of the thesis.

Doctor of Psychology. The Doctor of Psychology is awarded in clinical psychology when the following requirements have been completed: three years of full-time course work consisting of twenty-four to twenty-eight units, of which twenty units must be at the 400 level, practicum training in a minimum of five different clinical areas, a master's level report, a preliminary examination administered by a committee appointed by the dean of the Graduate College, one year of internship following the third year of course work, a report on an approved topic relevant to clinical practice (not a dissertation), and a final examination administered by a committee appointed by the dean of the Graduate College.

Although teaching is not a general Graduate College requirement, this department requires Ph.D. and Psy.D. candidates to do some teaching as part of their academic work, such experience being considered a vital part of the graduate program.

RADIO AND TELEVISION

Head of the Department: P. E. Welch
Correspondence and Information: Department of Radio and Television, University of Illinois at Urbana-Champaign, 119 Gregory Hall, Urbana, Illinois 61801

FACULTY

Professor: P. E. Welch
Assistant Professors: H. D. Blue, J. M. Gruebel
Lecturers: E. F. Douglass, D. P. Mullally

Graduate Program. The Department of Radio and Television offers graduate work leading to the Master of Science in Radio and Television. For the program leading to the Doctor of Philosophy in Communications, see page 67.

Admission. All applications, whether simply for admission or for admission and financial aid, must be supported by a personal statement of commitment to the goals of graduate education and to telecommunications as a profession, three letters of recommendation from persons qualified to judge the applicant's ability to carry on advanced study and research and his or her capacity to pursue a successful career in this field, and, if applicable, evidence of professional experience within the telecommunications industry. This supportive material should be sent directly to the Department of Radio and Television. Positions outside the department calling for broadcasting skills may be available to qualified applicants.

Master of Science. Requirements for the degree of Master of Science in Radio and Television include the following: a minimum of eight units consisting of a major of

at least four units including the Seminar in Radio and Television, a minor of at least two units, normally in an area outside the College of Communications, a one-unit thesis or approved project, a minimum of four units in courses (including thesis or approved project) at the 400 level, at least three of which must be in the major field.

ROMANCE LINGUISTICS

Graduate Programs. A concentration in romance linguistics is available to candidates for the Doctor of Philosophy in French, in Linguistics, or in Spanish. The curriculum is based upon appropriate course offerings in the three departments; further information may be obtained from the heads of those departments.

RUSSIAN LANGUAGE AND AREA STUDIES

Director of the Russian and East European Center: R. T. Fisher, Jr.
Correspondence and Information: Director of the Russian and East European Center, University of Illinois at Urbana-Champaign, 1208 West California Avenue, Urbana, Illinois 61801

FACULTY

Professors: P. P. Bernard, W. C. Blaylock, C. L. Dawson, F. Dovring, J. D. Fellmann, R. T. Fisher, Jr., M. Friedberg, J. Gorecki, F. M. Gottheil, K. A. Hitchins, D. R. Hodgman, K. A. Klein, P. B. Maggs, J. R. Millar, L. H. Miller, J. A. Nichols, T. Pachmuss, P. W. Schroeder, D. B. Shimkin, D. M. Shtohryn, L. Zgusta
Associate Professors: E. C. Bristol, R. Dunatov, F. Y. Gladney, S. P. Hill, H. H. Hock, R. E. Kanet, M. J. Kenstowicz, V. Mastny, J. P. McKay, D. L. Ransel, B. P. Uroff
Assistant Professors: K. N. Brostrom, L. Iribarne, E. F. McClure, M. M. Shorish

Graduate Programs. Graduate programs in Russian Language and Area Studies are offered by the Russian and East European Center in cooperation with various departments. The three programs listed below are designed to accompany work in a standard discipline such as anthropology or economics. Accordingly, it is the department of the student's primary discipline which receives and acts on the application for admission.

Minor for the Master's Degree. A candidate for the master's degree who elects Russian Language and Area Studies as a minor must earn at least two units of graduate credit in courses devoted to Russia and chosen from the fields of anthropology, economics, geography, history, law, library science, literature, political science, and sociology.

Minor for the Doctor of Philosophy Degree. A doctoral candidate who elects Russian Language and Area Studies as a minor must demonstrate a reading command of Russian as tested by examination or by completion of Russian 104 or 401 with a grade of A or B, and in addition, must earn at least four units of graduate credit in the group of relevant courses defined above. The four units must include courses from at least two departments outside of, and may at the same time include up to one unit from within, the department offering the candidate's major.

Certificate of Graduate Specialization in Russian Language and Area Studies. This certificate is awarded by the Graduate College and the Russian and East European Center. It is for persons with the baccalaureate who are enrolled in advanced

studies in any discipline and who wish at the same time to gain a knowledge of the Russian language and area. The requirements are as follow: (1) A good command of written and spoken Russian, as determined by special examinations. (2) At least six graduate units relating to Russia, distributed among at least three of the departments represented in the program (anthropology, economics, geography, history, law, library science, political science, Russian, and sociology) other than the student's own major department. If the student's major department is one of the aforementioned nine, up to one unit from the major department may be counted as part of this requirement. (3) A special essay based largely on Russian sources which must meet, at the minimum, the standard normally required in a master's thesis. A copy of the student's master's thesis or doctoral dissertation may be submitted in fulfillment of this requirement.

SLAVIC LANGUAGES AND LITERATURES

(Including Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, Slavic, and Ukrainian)

Head of the Department: MAURICE FRIEDBERG
Correspondence and Information: Department of Slavic Languages and Literatures, University of Illinois at Urbana-Champaign, 3092 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: C. L. DAWSON, M. FRIEDBERG, K. KLEIN, T. PACHMUSS
Associate Professors: E. BRISTOL, R. DUNATOV, F. Y. GLADNEY, S. P. HILL
Assistant Professors: K. BROSTROM, L. IRIBARNE, M. KENSTOWICZ

Graduate Programs. The Department of Slavic Languages and Literatures offers graduate work leading to the Master of Arts in Russian, Master of Arts in the Teaching of Russian, and Doctor of Philosophy in Russian literature or Slavic linguistics.

Admission. Students electing Russian as a major subject should have had the equivalent of at least four years of Russian in college, including practical work in the use of the language and some advanced course work in Russian literature.

Students choosing Russian as a minor subject should consult the department.

Master of Arts in Russian. In addition to fulfilling the general requirements of the Graduate College, candidates must pass both a written and an oral examination in their major and a Russian proficiency examination. Students may major in literature or linguistics. Students majoring in literature must present at least two courses in literature. No more than one unit of course work in a related field outside the department may be counted toward this degree. No master's thesis is required.

Master of Arts in the Teaching of Russian. All candidates for this degree are required to take: (1) Russian, five units, including at least two units from courses open only to graduates. (2) Education, two units, including one unit in educational psychology and one unit in history and philosophy of education. (3) Electives, one unit. These courses must be selected with the approval of the adviser. Candidates must pass an examination based on their course work and on a reading list. See page 35, requirements for teacher certification.

Doctor of Philosophy. All candidates for the Ph.D. must fulfill the general requirements of the Graduate College and must have a reading knowledge of French and German. A student may choose literature or linguistics as a major field. In addition to satisfying departmental language proficiency requirements, students will complete eight units beyond the M.A., of which no fewer than five will be within the student's major field of study. The student must also present a minor consisting of three grad-

uate-level courses in a single field or two such courses each in two fields. Possible minor fields include Russian literature, Slavic linguistics, another Slavic language or literature, or an acceptable subject area outside the department. A student with a double minor may elect to be examined in only one minor. Students majoring in Russian literature must complete two graduate-level courses in another Slavic language or literature in the original or both. Students majoring in Slavic linguistics must complete a minimum of three graduate-level courses in two other Slavic languages or literatures in the original or both.

Graduate courses are offered in the following Slavic languages: Czech, Old Church Slavonic, Polish, Russian, Serbo-Croatian, and Ukrainian.

SOCIAL SCIENCES

Correspondence and Information: J. R. Dahl, Director of the Program, Master of Arts in the Teaching of Social Studies, University of Illinois at Urbana-Champaign, 300c Gregory Hall, Urbana, Illinois 61801

Master of Arts in the Teaching of Social Studies. Candidates for this degree should hold secondary school social studies certificates. Eight units of graduate work are required. Four units are to be in the social studies (two of these must be in history); three units are in educational psychology, history and philosophy of education, and secondary and continuing education; and one unit is an elective chosen in consultation with the adviser.

SOCIAL WORK

Director of the School of Social Work: Donald Brieland
Associate Director: Charles H. Henderson
Correspondence and Information: Director, School of Social Work, University of Illinois at Urbana-Champaign, 1207 West Oregon Street, Urbana, Illinois 61801

FACULTY

Professors: D. Brieland, L. B. Costin, M. P. Hale, F. H. Itzin, M. A. Taber
Associate Professors: R. A. Downing, K. H. Gould, C. H. Henderson, B.-L. C. Kim, P. L. Leuenberger, M. M. Monkman, A. J. Vattano, S. H. Wattenberg, R. A. Weagant
Assistant Professors: C. D. Cowger, E. N. Gullerud, E. Handler, J. A. Lemmon, N. Weinberg-Asher

Graduate Programs. The School of Social Work offers programs leading to the Master of Social Work and the Doctor of Social Work. Social work career concentrations are provided in: social intervention which includes casework and group work; community organization and planning; and social policy and administration. The M.S.W. curriculum may be completed in sixteen months of continuous full-time study. A one year program is available for students who hold the B.S.W. degree from an accredited program. Students are encouraged to include electives from other departments. The D.S.W. curriculum requires two years of study beyond the master's degree. Field instruction is conducted through social agencies located in Urbana-Champaign, Decatur, Danville, Peoria, and Springfield, and by special arrangements in selected other communities. A 4.0 grade-point average is required of all students to receive the M.S.W. degree.

Admission. The applicant must meet the following minimum requirements: a minimum of twenty hours in social sciences courses and a course in statistics. Because applications for admissions usually have far exceeded capacity in recent years, the grade-

point averages of students admitted have been well above the minimum. The student must show evidence of physical capacity to complete a study program which taxes physical energy, emotional maturity, interest in and liking for people, an ability to establish effective and healthful relationships, and personal integrity as demonstrated by intellectual honesty and a sense of responsibility.

SOCIOLOGY

Head of the Department: BERNARD KARSH
Assistant to the Head: LORRAINE SELANDER
Director of Graduate Study: W. H. FORM
Correspondence and Information: Department of Sociology, University of Illinois at Urbana-Champaign, 326 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: D. J. BORDUA, N. K. DENZIN, F. C. FLIEGEL, W. H. FORM, J. GORECKI, N. JACOBS, H. M. JOHNSON, B. KARSH, G. LUESCHEN, J. ROBINSON, R. J. SIMON, S. SUDMAN
Associate Professors: H. M. CHOLDIN, J. HUBER, R. JONES, S. J. KRONUS, K. LAND, C. MCPHAIL, A. SOFRANKO, M. SOLAUN, K. SOUTHWOOD, J. L. SPAETH, J. C. VAN ES, N. F. WILEY
Assistant Professors: J. BRISSY, W. COCKERHAM, M. FELSON, J. R. KIMBERLY, R. KRAUS, C. L. KRONUS, W. E. MAXWELL, J. F. O'CONNOR, J. SALLOWAY, R. SCHOEN, R. D. VANNEMAN
Research Assistant Professor: R. ROISTACHER

Graduate Programs. The Department of Sociology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. The Master of Arts program is in general, designed as a first step toward the doctorate. Considerable specialization is encouraged in the Ph.D. program to prepare students for careers in research and teaching at the college and university level and for research careers in government and industry.

Admission. Students applying for admission should have a strong undergraduate background in one of the social sciences, preferably sociology. Prior training in logic, philosophy of science, mathematics, and statistics is given special attention in considering applicants. Applicants must submit Graduate Record Examination scores on the tests of verbal ability, quantitative ability, and on the advanced test in sociology.

Master of Arts. A candidate for the M.A. in sociology must earn ten units of graduate credit, including one advanced course in research methods and one advanced course in statistics.

Doctor of Philosophy. Candidates for the Ph.D. must satisfactorily complete two advanced courses in statistics and two in research methods. All candidates must be examined and certified as competent in sociological theory, research methods, an area of specialization, and in two supplementary substantive areas. Information on additional requirements is given in the departmental manual for graduate students.

SPANISH, ITALIAN, AND PORTUGUESE

(Including Catalan and Rumanian)

Head of the Department: A. M. PASQUARIELLO
Correspondence and Information: Department of Spanish, Italian, and Portuguese, University of Illinois at Urbana-Champaign, 4080 Foreign Languages Building, Urbana, Illinois 61801

FACULTY

Professors: S. W. Baldwin, Jr., W. C. Blaylock, B. Dutton, M. H. Forster, R. E. Lott, A. M. Pasquariello, A. Porqueras-Mayo
Associate Professors: A. Aiex, H. W. Cowes, M. Francescato, D. R. Hershberg, T. C. Meehan, R. A. Peto-Todas, M. D. Saltarelli, D. Wanner
Assistant Professors: M. M. Azevedo, A. Cassell, A. Dunzo, A. Musumeci

Graduate Programs. The Department of Spanish, Italian, and Portuguese offers work leading to the Master of Arts and Doctor of Philosophy in Spanish, in Italian, or in Portuguese, and to a Master of Arts in the Teaching of Spanish. Fields of concentration are Spanish linguistics, romance linguistics, Spanish literature, Latin American literature, Italian literature, and Portuguese literature. Graduate courses in Catalan and Rumanian are available.

Admission. Prerequisite for a graduate major is an undergraduate major in one romance language or Latin, or consent of the department. Applicants living in the United States who intend to major in Spanish must submit Graduate Record Examination scores on the verbal and quantitative tests and on the advanced test in Spanish. Students doing graduate work for any advanced degree in Spanish must possess or acquire a practical command of the language. For the Doctor of Philosophy, some knowledge of Italian or Portuguese is required. Parallel training in one or more other languages or literatures, such as English, French, German, Greek, Italian, Latin, and Portuguese is desirable.

The programs in Spanish are described below. Individual programs will be developed for students who wish to major in Italian or Portuguese. For additional information consult the department.

Master of Arts. In addition to fulfilling the general requirements of the Graduate College, candidates must pass a comprehensive examination based on course work and on a general reading list. Three areas of specialization are offered: Spanish or Spanish-American literature, Spanish linguistics, and the teaching of Spanish. Detailed statements of the course requirements for each specialization may be obtained from the department.

Doctor of Philosophy. Students working toward the Doctor of Philosophy are admitted with provisional departmental status until their performance in graduate work is judged acceptable for full departmental status by the department's graduate committee. A comprehensive written examination is used as a basis for this judgment. Candidates are required to present evidence of a reading knowledge of French and of one other language to be selected in consultation with the adviser, and candidates in Spanish are expected to take at least two units in seminar courses.

Five areas of specialization are available: Renaissance and golden age, Spanish literature of the nineteenth and twentieth centuries, Latin American literature, Spanish linguistics, and romance linguistics. For the specialization in Spanish linguistics, general linguistics is a required minor; the department should be consulted on the selection of minors for the other specializations.

SPEECH AND HEARING SCIENCE

Head of Department: John J. O'Neill
Correspondence and Information: John J. O'Neill, Department of Speech and Hearing Science, University of Illinois at Urbana-Champaign, 601 East John Street, Champaign, Illinois 61820

FACULTY

Professors: C. W. Kim, J. J. O'Neill, S. P. Quigley, E. W. Stark, W. R. Zemlin
Associate Professors: F. L. Johnson, M. E. Joseph, J. L. Locke, M. A. O'Neill, E. P. Paden, L. J. Sanders, R. K. Simpson

Assistant Professors: P. B. Arlt, D. L. Bode, W. DeMarco, J. G. Erickson, B. W. Hodson, R. G. Johnston, F. L. Nasca, S. J. Peterson

Graduate Programs. The department offers courses leading to the Master of Arts, Master of Science, and Doctor of Philosophy in Speech and Hearing Science, and the Master of Science in the Education of the Deaf.

Admission. Admission to the program in education of the deaf requires the completion of a baccalaureate or an equivalent degree comparable to that granted by the University of Illinois. For all other areas: satisfactory completion of a four-year curriculum preparatory to speech and hearing science, speech pathology or audiology, or sixteen hours of undergraduate credit in the following areas or their equivalents: speech pathology, audiology, phonetics, and anatomy and physiology of the vocal mechanism, or speech science and/or voice science.

Master's Degrees in Speech and Hearing Science. Two types of master's degrees are offered: the Master of Science and the Master of Arts. The incoming student in both of these programs takes an examination covering audiology, speech and hearing science, and speech pathology. The examination serves two purposes: to assess the student's general knowledge of the basic aspects of these areas (qualifying), and to evaluate specific strengths and weaknesses in the student's major area of study (evaluative). The results of these examinations are used to help students plan their graduate programs. As a part of the requirements for either degree the student must pass the qualifying examination in his nonmajor areas sometime during his course of study.

Master of Science. The program leading to the degree of Master of Science is usually considered to be a terminal program for the purpose of training competent clinicians who intend to seek employment in the school environment. It is designed to provide comprehensive knowledge of the various types of speech, hearing, and language disorders, their causes, and the principles of diagnostic and therapeutic management. This program requires four units from a group of courses appropriate to the areas of speech pathology, audiology, or language; two units from selected courses in education; and two units of electives.

Master of Arts. The Master of Arts may be taken as either a terminal degree or as preparation for further graduate study with concentration in audiology, language, speech and hearing science, or speech pathology. It is recommended for those students who plan to continue their education in a doctoral program as well as for those students who plan to terminate their formal education with the Master of Arts. As a terminal degree it is designed to insure clinical competence. As a nonterminal degree it permits the student to take the basic professional courses which then become an integral part of the student's entire graduate program. Students may take all eight units within the four specialized areas or may elect a minor outside the department. The only course which is required of all candidates is Speech 399 (Design and Analysis of Experiments in Speech and Hearing Science). A thesis can be a part of the A.M. program depending upon the candidate's educational and professional goals.

Doctor of Philosophy. The doctoral program provides intensive training in speech and hearing processes and disorders. The program may be planned with specialization in any one of the four areas: audiology, language, speech and hearing science, and speech pathology. The minimum academic requirement for this degree is sixteen units. If there are deficiencies in the student's background, additional courses will be required and courses taken for this purpose are usually not counted toward the minimum requirement. In addition, if the candidate did not write a thesis as part of his master's program, he will be required to demonstrate his research competence during his initial semester of study. Individual study programs tailored to the special needs of the student are planned by the student and his adviser. The only courses which are required are Speech 475 (Experimental Phonetics, I) and Speech 476 (Experimental Phonetics, II).

Master of Science in Education of the Deaf. The program is focused on preparing elementary-level teachers of the hearing impaired. A minimum of eight units of course work, at least three of which are to be at the 400 level, History and Philosophy of Education 304 and 305, and Educational Psychology 311 and 312 are required.

SPEECH COMMUNICATION

Head of the Department: ROGER NEBERGALL
Director of Graduate Study: KENNETH ANDERSEN
Correspondence and Information: Director of Graduate Study, Department of Speech Communication, University of Illinois at Urbana-Champaign, 244 Lincoln Hall, Urbana, Illinois 61801

FACULTY

Professors: K. E. ANDERSEN, J. J. BATEMAN, K. W. BROADRICK, H. L. MUELLER, R. E. NEBERGALL, M. H. NICHOLS
Associate Professors: J. C. AHART, R. A. CLARK, J. G. DELIA, R. L. INCE, J. H. MACLAY, E. P. PADEN, S. H. THOMAS, J. W. WENZEL
Assistant Professors: D. L. BODE, F. P. HILPERT, L. HUDSON, C. R. KRAMER, J. H. PATTON, J. F. PAZERESKIS, E. M. RITTER, K. W. RITTER, D. L. SWANSON

Graduate Programs. The Department of Speech Communication offers courses leading to the Master of Arts and Doctor of Philosophy.

Admission. The Graduate Record Examinations, verbal and quantitative are required in all curricula.

Master of Arts. For the degree of Master of Arts, students may concentrate in rhetorical and communication theory or interpretation. They may also select a special curriculum in the teaching of speech. The entering student should present the equivalent of sixteen hours of undergraduate work in speech, communications, or interpretation. In addition to meeting general regulations of the Graduate College, a final written examination is required of all candidates. In some cases an oral examination is also stipulated. A thesis is optional, and may constitute a maximum of two units of credit. Students wishing to concentrate in theatre should apply to the Department of Theatre.

Master of Arts in Teaching. Candidates must first be admitted to a degree program in rhetorical and communication theory or interpretation. Degree requirements can be met by summer attendance. In meeting Graduate College requirements and department requirements including the comprehensive examination, M.A.T. candidates must complete six units of work in the department plus the units of required work in education. See page 35.

Doctor of Philosophy. For the Doctor of Philosophy, students may exercise one of three options: rhetoric and communication theory, theatre, and interpretation. Students are accepted as candidates for the doctor's degree who present either a well-rounded undergraduate education with an emphasis in speech, and a master's in a cognate discipline, or who hold a master's degree in speech or theatre from an accredited institution. Students wishing to concentrate in theatre should contact the Department of Theatre for information on this option.

In addition to meeting general regulations of the Graduate College, the student must pass written and oral preliminary examinations, and oral examination in defense of the dissertation prospectus, as well as the oral defense of the dissertation. Students must demonstrate competency in research procedures and tools which may include proficiency in one or more foreign languages, or various research methodologies and tools or cognate academic work.

Specific information on all programs of study is supplied to all who contact the department asking for information about graduate study.

THEATRE

Head of the Department: BURNET M. HOBGOOD
Correspondence and Information: Head, Department of Theatre, University of Illinois at Urbana-Champaign, 4-122 Krannert Center for the Performing Arts, Urbana, Illinois 61801

FACULTY

Professors: C. M. BEHRINGER, B. M. HOBGOOD, C. H. SHATTUCK, B. R. WORKS
Associate Professors: J. C. AHART, P. J. BRADY, D. A. LLEWELLYN, R. TYMCHYSHYN
Assistant Professors: P. FRANKLIN-WHITE, M. C. HARDY, K. MCLEAN, S. MURRAY

Graduate Programs. The Department of Theatre offers graduate work leading to the Master of Arts and to the Master of Fine Arts in Theatre and, in cooperation with the Department of Speech Communication, the Doctor of Philosophy in Speech with a theatre option.

Admission. Applicants will be considered who have either an undergraduate major in theatre, which includes at least nine hours in dramatic literature as part of, or in addition to, the major, or any undergraduate major which includes at least nine hours of basic courses in theatre (acting, directing, production) and seven hours in speech or dramatic literature. An audition and/or interview, with submission of portfolio in non-performance areas, is required for admission to the program leading to the degree of Master of Fine Arts in Theatre. Applicants will be considered for admission to the program leading to the degree of Doctor of Philosophy in Speech with a theatre option who have at least a 4.0 average in the last four semesters of graduate and undergraduate work, and a Master of Arts or a Master of Fine Arts in Theatre, or the equivalent.

Master of Arts. A candidate for the A. M. must spend at least two semesters in residence; must complete at least eight units of course work in theatre and related studies, including at least two units in history and theory of theatre and two in applied theatre; and must pass a final comprehensive examination. A full-time student can complete this program in one academic year.

Master of Fine Arts. The M.F.A. is a terminal program in the areas of theatre practice. The candidate for this degree must spend at least four semesters in residence; must complete at least fourteen units of course work, six in studio or colloquium courses, three in electives, and two in a creative project which will be the culmination of his work. A diagnostics examination will determine history and theory requirements for each candidate. Only full-time students will be admitted to the program; they should complete it in two academic years.

Doctor of Philosophy. Requirements for the degree are a minimum of eight units in courses in theatre and related studies beyond the master's, a reading knowledge of two foreign languages, or of one foreign language and one of the prescribed substitutes, a minimum of eight units of dissertation research, a comprehensive oral and written examination, and defense of the dissertation before a committee of the graduate faculty. The program requires two to three years beyond the master's to complete.

THEORETICAL AND APPLIED MECHANICS

Head of the Department: RICHARD T. SHIELD
Graduate Program Coordinator: JOHN S. WALKER
Correspondence and Information: Graduate Program Coordinator, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, 212 Talbot Laboratory, Urbana, Illinois 61801

FACULTY

Professors: A. P. Boresi, C. E. Bowman, D. E. Carlson, M. E. Clark, H. T. Corten, G. A. Costello, R. A. Eubanks, C. E. Kesler, H. L. Langhaar, T. J. Lardner, R. E. Miller, J. Morrow, J. M. Robertson, R. T. Shield, O. M. Sidebottom, G. M. Sinclair, M. C. Stippes, C. E. Taylor, H. R. Wetenkamp, W. J. Worley
Associate Professors: J. D. Buckmaster, T. M. Elsesser, J. W. Phillips, J. S. Walker
Assistant Professors: R. J. Adrian, N. E. Asbaugh, F. G. Bauling

Graduate Programs. The Department of Theoretical and Applied Mechanics offers a full course of study leading to the Master of Science and Doctor of Philosophy degrees. Students may specialize in such areas as elasticity, plasticity, elastic stability, wave propagation, dynamics and vibrations, photoelasticity, fatigue of metals, crack propagation, ideal or viscous fluid flow, magnetohydrodynamics, biomechanics, and shell theory.

Admission. Students admitted for graduate work in Theoretical and Applied Mechanics usually have a bachelor's or master's degree in engineering. However, students with majors in mathematics, physics, computer science, and similar areas may also be admitted.

Master of Science. Candidates are required to complete a minimum of eight units of graduate work including a thesis (ordinarily two units) and to maintain a minimum grade point average of 3.75. Students are required to register for the Seminar in Engineering Mechanics. If a student elects not to present a thesis, nine units of course work are required. A full-time student can complete this program in one academic year of study. A student who has an assistantship normally completes the requirements in one calendar year.

Doctor of Philosophy. Candidates for the Doctor of Philosophy are required to complete eight units of course work beyond the master's degree with a minimum grade-point average of 4.0, including at least one-half unit from each of the following major areas in the department: applied mathematics, dynamics and vibrations, fluid mechanics materials engineering, and solid mechanics. Students are required to register for the Seminar in Engineering Mechanics. A student must pass an oral preliminary examination before commencing his dissertation. The thesis research normally comprises about half the work beyond the master's degree. A student can complete this program in two years' study beyond the master's degree.

URBAN AND REGIONAL PLANNING

Head of Department: Michael P. Brooks
Correspondence and Information: Head of the Department of Urban and Regional Planning, University of Illinois at Urbana-Champaign, 909 West Nevada Street, Urbana, Illinois 61801

FACULTY

Professors: L. F. Blair, M. P. Brooks, C. W. Forrest, E. C. Freund, W. I. Goodman, A. Z. Guttenberg, S. Keyes, L. B. Wetmore
Associate Professors: A. G. Onibokun, J. A. Quinn
Assistant Professors: L. F. Heumann, A. M. Isserman, C. V. Patton, M. C. Romanos

Graduate Program. The Department of Urban and Regional Planning offers graduate work leading to the degree of Master of Urban Planning.

Admission. While the social sciences, the design professions, civil engineering, and urban planning are relevant undergraduate backgrounds for graduate work in planning, consideration will also be given to students prepared in the humanities, the physical sciences, and other fields.

Master of Urban Planning. The master's degree program is designed to prepare students for careers in planning. Such careers can involve service in public agencies, at any of the levels of government, in private consulting practice, or in other organizations in need of planning services. Alternatively, the program may prepare students for advanced work leading to the Ph.D. degree and a career in teaching or research or both. The program combines a set of minimum requirements with a high degree of flexibility and choice. The course of study ordinarily requires two years. First-year students typically take courses focusing on the basic elements of planning, including studies in planning theory, analytical methods, planning procedure, and administration. The second year provides opportunities for further work in areas of specialized interest. To qualify for the degree, a student must complete a minimum of either (1) twelve units, if a zero-credit internship course (UP 340 or UP 440) is successfully completed; or (2) thirteen and one-half units, if one of the internship courses is not elected. (The internship must be preceded and succeeded by at least one semester of course work in residency on campus.) At least eight units must be in urban and regional planning courses (six and one-half units for students completing UP 340 or UP 440). At least three units must be at the 400 level, and two of these must be in urban and regional planning.

VETERINARY MEDICAL SCIENCE

Head of the Department: L. Meyer Jones
Acting Assistant Head: Lyle E. Hanson
Correspondence and Information: Department of Veterinary Medical Science, University of Illinois at Urbana-Champaign, 141 Veterinary Medicine Building, Urbana, Illinois 61801

FACULTY

Professors: P. D. Beamer, P. R. Fitzgerald, L. E. Hanson, H. J. Hardenbrook, L. C. Helper, W. G. Huber, L. M. Jones, N. D. Levine, R. P. Link, R. C. Meyer, W. L. Myers, M. Ristic, A. H. Safanie, A. G. Schiller, D. Segre, J. Simon, E. Small, A. R. Twardock, A. M. Watrach, G. T. Woods
Associate Professors: J. L. Dorner, G. L. Jackson, A. H. Killinger, D. O. Morgan, W. M. Newton, H. A. Reynolds, H. E. Rhoades, D. L. Smetzer, J. C. Thurman, K. S. Todd, W. A. F. Tompkins

Graduate Programs. The Department of Veterinary Medical Science offers graduate work leading to the degrees of Master of Science and Doctor of Philosophy. Fields of specialized study in the department include: anatomy, clinical sciences, immunology, microbiology, parasitology, pathology, pharmacology, and physiology.

Special Degree Requirements. For M.S.: (1) eight units of coursework, of which four units must be in VMS with two of these at the 400 level; (2) one-quarter unit of VMS seminar credit; (3) thesis on original research; (4) final comprehensive examination.

For Ph.D.: (1) twenty four units of coursework (eight units are allowed toward the Ph.D. for a master's degree completed elsewhere), twelve of which including thesis research must be in VMS and six of which must be in other departments; (2) one-half unit of VMS seminar credit; (3) course VMS 340 (Applied Statistics) or Biology 371 (Quantitative Biology); (4) reading proficiency in either French, German, Russian, or Spanish (other languages may be approved by petition); (5) preliminary examination; (6) thesis on original research; (7) final examination.

Admission. Applicants' undergraduate programs should include at least five semester hours of physics or mathematics, fourteen hours of chemistry, and fifteen hours of biological sciences. A student who is deficient in these subjects may be accepted but must remove the deficiency during his first year of residence. Qualifications of students must be approved by the department's Committee on Admission of Graduate Students.

Where to Write

ADMISSION

Graduate and Foreign Admissions
University of Illinois at Urbana-Champaign
312 Metallurgy and Mining Building
Urbana, Illinois 61801
or
The Graduate College
University of Illinois at Urbana-Champaign
330 Administration Building
Urbana, Illinois 61801

EMPLOYMENT (Hourly)

Director, Student Employment
University of Illinois at Urbana-Champaign
420 Student Services Building
Champaign, Illinois 61820

EXTRAMURAL CLASSES

Office of Continuing Education and Public Service
University of Illinois at Urbana-Champaign
118 Illini Hall
Champaign, Illinois 61820

FELLOWSHIPS, ASSISTANTSHIPS, OTHER FINANCIAL AID

The prospective department

FOREIGN STUDENTS (Passport, Visa Assistance)

Director, Office of Foreign Student Affairs
University of Illinois at Urbana-Champaign
310 Student Services Building
Champaign, Illinois 61820

HOUSING

Director, Housing Division
University of Illinois at Urbana-Champaign
420 Student Services Building
Champaign, Illinois 61820

MOTOR VEHICLE AND BICYCLE REGISTRATION

Motor Vehicle Registration Office
University of Illinois at Urbana-Champaign
601 East John Street
Champaign, Illinois 61820

SERVICES FOR PERMANENTLY PHYSICALLY HANDICAPPED STUDENTS

Division of Rehabilitation-Education Services
University of Illinois at Urbana-Champaign
Rehabilitation-Education Center
Champaign, Illinois 61820

VETERANS

Veterans Educational Benefits
University of Illinois at Urbana-Champaign
130 Student Services Building
Champaign, Illinois 61820

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